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General Population Estimates of the Association between College Experience and the Odds of Forced Intercourse

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Abstract

Sexual assault on college campuses is a pervasive problem, recently receiving increased scientific and policy attention. However, the high focus on college student experience ignores general population prevalence, trends, and differences between those with college experience and those without. We analyze measures from the National Survey of Family Growth (NSFG) to provide a general population view of experiences with forced intercourse. Forced intercourse is a common experience in the U.S. population, has remained stable in recent years, and varies greatly by gender, age and race. The odds of forced intercourse are also significantly higher among those with less than four years of college. This ubiquitous public health problem is not limited to college campuses. Measures from the NSFG are an important resource for understanding population rates of (and trends in) forced intercourse, providing information to guide interventions and better target scientific investigation.

Keywords

Forced intercourse; Population trends; Survey methodology

Introduction

Sexual assault on college campuses has made front page news (Anderson and Clement 2015; Anderson and Svrluga 2015), and drawn substantial attention from the United States' federal government (Obama 2014; United States Department of Education 2014; The White House Council on Women and Girls 2014). Research among college students demonstrates that the probability of experiencing a sexual assault is high (Cantor et al. 2015; Fedina, Holmes, and Backes 2016; Krebs et al. 2009; Lawyer et al. 2010). For example, results from a study

conducted by the Association of American Universities estimate that on many campuses more than 20% of undergraduate women experience sexual assaults each year (Cantor et al. 2015). Scholars of the topic generally point out that we have ignored prior evidence of this problem and that it takes a substantial toll on human health and wellbeing (Brener et al. 1999). In-depth studies of the experience of sexual misconduct and the situations surrounding sexual misconduct have much to offer in advancing our knowledge (Armstrong, Hamilton and Sweeney 2006; Bay-Cheng and Eliseo-Arras 2008; Boswell and Spade 1996; Copenhaver and Grauerholz 1991; Gross et al. 2006; Kalof 1993; Kitzinger and Frith 1999; Tyler, Hoyt and Whitbeck 1998). However, the vast majority of the studies in this area have examined the prevalence of sexual assault on college campuses only, without considering its prevalence among those who are not currently attending college, including those with and without college experience.

This gap in knowledge is important because there are strong theoretical reasons to expect that young people on college campuses are more *protected* from potential sexual assaults than those of the same ages who are not on college campuses. The reasons involve mechanisms of both selection and causation. On the one hand, young people who attend college are selectively those with more resources and fewer risk factors for sexual assault, both of which may contribute to lower experience of sexual assault than those who do not attend college. On the other hand, there are also reasons to expect that being on a college campus reduces the odds of experiencing a sexual assault. Although these young people are exposed to a high level of interaction with similarly aged members of the opposite sex, these interactions take place within a more highly structured and supervised context, including dormitory living, classrooms, supervised extra-curricular activities and even supervised libraries and study halls. Many college campuses also offer organized programs of sexual assault awareness and prevention, designed to reduce these risks. College attendance is also known to slow entry into the courtship process relative to same-aged people who do not attend college (Thornton, Axinn and Xie 2007). Thus many different mechanisms all work toward reducing the risk of sexual assault for those on college campuses. Rates of sexual assault on college campuses are high, to be certain (Cantor et al. 2015; Fedina, Holmes, and Backes 2016; Krebs et al. 2009; Lawyer et al. 2010), but there is a strong theoretical foundation for expecting that the rates of sexual assault may be even *higher* among those in the same age groups who are not attending college.

The U.S. has benefitted from several national studies that measure experiences of sexual assault in the general population, and these studies could be used to document differences in levels of sexual assault between those who attend college and those who do not. However, each of these has specific strengths and weaknesses. Some studies use such data to compare *current* college students to those who are not enrolled in college, and these have shown that people enrolled in college actually have lower rates of sexual assault (Kilpatrick et al. 2007; Rennison and Addington 2014; Sinozich and Langton 2014). Unfortunately, these studies may underestimate the prevalence of sexual assault because they measure sexual assault with survey questions asked aloud by interviewers, asked with relatively abrupt screening measures, or asked in a context of questions on other forms of violence or criminal behavior (National Research Council 2014). Studies focused on current enrollment also have the potential to underestimate differences across levels of college experience because they do

not compare the *cumulative* experience of assault between adults who have and have not attended college. Investigation of cumulative experience of sexual assault among older adults has the potential to reveal the consequences of completing four or more years of college rather than relatively little or no college. Measures created outside the context of criminal behaviors and experiences also have high potential to reveal the full extent of sexual assault in the general population.

The U.S. National Survey of Family Growth (NSFG) provides a special opportunity to learn more about this high priority public health problem. The NSFG is a national face-to-face survey on the topics of family and reproductive health experiences. It features lifetime histories of sexual partnerships, pregnancies, sex and reproductive health issues. After these lifetime histories the NSFG uses audio-computer assisted self-interviewing (ACASI) to provide privacy and immediate response encryption while asking questions about sensitive reproductive health issues such as trading sex for drugs or experiences with abortion. Some of these questions measure experiences with forced intercourse. Forced intercourse represents just under half of all sexual assaults, but it is a severe form of sexual assault, with many associated health risks and with potential for long term adverse consequences (Brener et al. 1999; Cantor et al. 2015; Krebs et al. 2009).

As an important complement to other data sources that have been used to study this important problem, the NSFG therefore offers a nationally representative sample of persons between the ages of 15–44, private measurement (via ACASI, to ensure less reporting bias) of experiences with forced intercourse and the circumstances surrounding it *outside of a criminal context*, relatively high response rates that generally exceed 70% (reducing potential nonresponse bias; Brick and Williams 2013), measures of cumulative experience attending college, and several important covariates that can be used to adjust for important socio-economic and socio-demographic differences between those with and without college experience. In the present study, we leverage recent NSFG data to address the aforementioned crucial gaps in knowledge by documenting the rates of ever experiencing forced intercourse across different subgroups of the general U.S. adult population defined by experience attending college (including those who never attended college). We also provide important descriptive information about the circumstances of forced intercourse in the United States based on the NSFG data.

Theoretical Framework

The theoretical reasons to expect that people who have had experience on college campuses are more protected from potential sexual assaults than those of the same ages who have not derive from both the processes of selecting individuals into college attendance and the experiences that take place at those campuses. First we review key processes of selection into college attendance that may decrease the odds of experiencing an assault among those on college campuses. We then turn to reasons why attendance on college campuses may reduce the odds of sexual assault relative to those of the same ages who do not attend college campuses. Finally, we consider reasons why attendance at college may increase the risk of sexual assaults.

Selection

Young people who attend college are selectively those with more resources and fewer risk factors for sexual assault, both of which may contribute to lower experience of sexual assault than those who do not attend college. The literature documenting selection on resources is particularly extensive. Those with wealthy parents, parents with higher educations, and other assets are more likely to attend college (Grusky, Kanbur, and Sen 2006; Hauser and Featherman 2013; Sewell, Haller, and Portes 1969). These same pre-existing resources are likely to expose young people to sexual assault at lower rates than those with less wealthy and educated families. Though much less research has investigated the association between parental financial and educational resources and subsequent experiences of sexual assault, the work which has been done is consistent with elevated risk among children of less well-resourced parents (King et al. 2004). Research consistently shows a strong association between having low household income and the risk of experiencing sexual assault (Planty et al. 2013; Walby and Allen 2004). More research is needed, but it is likely that lower parental resources reduce the odds of attending college and also increase the odds of experiencing sexual assault.

Young people with lower levels of known risk factors for sexual assault are also selected to attend college at higher rates. For example, intoxication is a well-known risk factor for experience of sexual assault (Abbey, Ross, and McDuffie 1994; Krebs, Lindquist, Warner, Fisher, and Martin 2007; Ullman, Karabatsos and Koss 1999). However, prior experience with intoxication either reduces the odds of attending college or has no influence (Center for Behavioral Health Statistics and Quality 2014; Johnston, O'Malley, Bachman, Schulenberg, and Miech 2015; Martins et al. 2015; Patrick, Schulenberg, and O'Malley 2016). Results from these studies indicate that college attendance is selective for those less likely to use drugs or smoke, but no differences have been demonstrated in the prevalence of heavy drinking between those who do and do not attend college (Center for Behavioral Health Statistics and Quality 2014; Johnston, O'Malley, Bachman, Schulenberg, and Miech 2015; Martins et al. 2015; Patrick, Schulenberg, and O'Malley 2016). In another important example, prior victimization is also a strong, well-documented predictor of subsequent experiences of sexual assault (Street et al. 2016). Analyses of nationally representative longitudinal data about sexual experience in the U.S. population indicate that early life forced intercourse reduces the odds of subsequent college attendance (Rees and Sabia 2013). In both cases, prior experiences likely to increase the odds of subsequent experience of sexual assault are also likely to reduce the odds of college attendance.

Together, these types of selection mechanisms mean that those young people who attend college are less likely to experience sexual assault because of pre-existing differences than same-aged people who do not attend college. Again, this does not mean that rates of sexual assault on college campuses are low, but instead that rates of sexual assault among those who do not go to college may be even higher.

College Experiences

There are also reasons to expect that being on a college campus may reduce the odds of experiencing a sexual assault compared to same-aged young people who are not on college

campuses. First, many college campuses offer *organized programs of sexual assault awareness and prevention* designed to reduce the risks of sexual assault. Careful study of these programs demonstrates that they can in fact reduce the likelihood of experiencing sexual assault (Senn et al. 2015). Living within a population that is an ongoing target of these programs, therefore, is likely to reduce the odds of experiencing sexual assault relative to the general population that has not attended college before.

Second, young people enrolled in college experience a *high level of supervision by others* relative to young people the same age living in the general population outside of college campuses. For example, young people living outside of college campuses are much more likely to live alone or with housemates than those the same age who are living on a college campus (Goldscheider and Goldscheider 1999). Many of those attending college live in dormitories or similar living arrangements. Although these young people are exposed to a high level of interaction with similarly aged members of the opposite sex, these interactions take place within a more highly structured and supervised context. Though dormitory living may be associated with sexual assault on some campuses or within specific groups of students (Krebs et al. 2007), dormitories provide a higher level of supervision than off-campus living, which likely reduces the odds of assault relative to those who are not enrolled in college. Other social spaces are also more likely to be supervised for those attending college than those who are not attending college, including classrooms, extra-curricular activities, libraries and study halls. Together, this higher level of supervision by others is likely to reduce the odds of experiencing sexual assault relative to those who are not attending college.

Third, experience attending college is also known to *slow entry into courtship processes* relative to same-aged people who do not attend college. College attendance is well known to delay entry into long-term sexual relationships, such as marriage, and shorter-term sexual relationships, such as cohabitation (Thornton, Axinn, and Xie 2007). Some experiences of sexual assault actually take place within the context of marriage or other sexual relationships like premarital cohabitation (Russell 1982; Tjaden and Thoennes 2000). Factors that delay entry into courtship and sexual relationship also delay exposure to the risk of sexual assaults within these relationships, reducing the odds of sexual assault by any specific age. Therefore attending college is likely to reduce the odds of experiencing sexual assault by each specific age.

In sum, the mechanisms of selection into (and experiences after) college enrollment may work to reduce experiences of forced intercourse among those who attend college the longest. For these reasons, rates of sexual assault may be even higher among those in the same age groups who attended college the least.

Potential for College Attendance to Increase the Risk of Sexual Assault

We also consider reasons why attending college may increase the risk of sexual assault. Grounded in the routine activities approach to understanding assaults (Cohen and Felson 1979; Sherman, Gartin and Buerger 1989), it may be that the activities of college students involving social experiences, substance use, or other dimensions of interaction explicitly connected to sexual relationships increase the risk of assaults. For example, research on

binge drinking on college campuses demonstrates an association between the prevalence of binge drinking and the likelihood of sexual assault (Wechsler et al. 1994). Alcohol consumption at college campus social events has also been linked to increased risks of sexual assault (Abbey 2002). A key limitation of these studies is the absence of a same-age comparison group not attending college. Nevertheless, these types of results may be consistent with the possibility that attendance at college increases the risk of sexual assault, rather than reducing that risk. We accommodate this possibility in our statistical analyses.

Data and Methods

The U.S. has multiple studies of the general population that can be used for population-level investigation of the important correlates of sexual assault. An important example is the U.S. National Crime Victimization Survey (NCVS). A key advantage of the NCVS is that it measures a fully representative sample of the general U.S. population. This means the NCVS can be used to document variations in the experience of sexual assault across the many different kinds of Americans who compose the full population, including those who do not attend college along with those who do attend college.

Many Americans attend college between the ages of 18 and 24, and this is precisely why the U.S. Department of Justice used NCVS data to focus on those aged 18–24 and compare sexual assault experiences between those currently attending college and those who are not currently attending college (Sinozich and Langton 2014). Their report indicates that Americans aged 18–24 are 1.2 times more likely to experience sexual assault if they are *not currently enrolled* than if they are currently enrolled (Sinozich and Langton 2014). However, the NCVS is also characterized by important weaknesses for measuring experiences of sexual assault in the general population. A recent National Research Council review of the methodological issues surrounding the survey measurement of sexual assault concluded that the NCVS may underestimate the prevalence of sexual assault (National Research Council 2014). Reasons for this include the in-person administration of NCVS interviews by interviewers, reducing privacy, the use of a screening measure with little context, and the criminal behavior context of that survey. Also, this comparison based on current enrollment may underestimate the cumulative difference produced by completing four or more years of college. As we explain below, analyses of the NSFG represent an important complement to analyses of data from other sources such as the NCVS.

The U.S. National Survey of Family Growth (NSFG)

The U.S. NSFG is an important national resource for understanding the prevalence of forced intercourse in the general U.S. population. The NSFG is specifically designed as the national source of statistics on sexual relationships, reproductive health, childbearing and closely related matters (Groves et al. 2009a). This survey measures lifetime histories, for women and men aged 15–44, of sexual partnerships, non-marital cohabitations, marriages, divorces, contraception, pregnancies, sexually transmitted diseases, and a range of related factors. The NSFG asks both women and men about forced intercourse, including those who have and those who have not attended college. Women are asked about vaginal intercourse and men are asked about oral, anal, and vaginal intercourse (Chandra et al. 2005). The historical focus

of the NSFG on fertility and reproductive health motivates the emphasis on forced vaginal intercourse for women (Williams, Brett, and Abma 2009). Men were added to the NSFG beginning in 2002, and the different question wording used for men reflects differences in male experiences. For a more detailed review of the scientific basis for the specific questions used, please see Hamby's 1998 report (Hamby 1998).

Because it is neither a survey of sexual assault nor a survey of criminal experiences, the NSFG places a lifetime sexual health context around the question of forced intercourse. Methodological research reveals that cognitive anchors (memorable experiences) assist survey respondents in recalling more detailed parts of their experiences (Belli 1998; Schwarz and Sudman 1994). The NSFG asks about lifetime experience of forced intercourse following a detailed lifetime reporting of all sexual relationships and key sexual events – this lifetime reporting cognitive task helps respondents recall memorable features of their sexual experience. In the NSFG, “force” could include a range of pressures, including physical force, verbal pressure, or being given drugs or alcohol. As was mentioned earlier, the NSFG measures these circumstances as well, allowing us to document them.

The NSFG data are collected in a face-to-face interview setting, and when the content of the survey transitions from broader lifetime histories to the most sensitive questions, such as questions about experiences with abortion, sexually transmitted diseases, trading sex for drugs, or forced intercourse, the interview changes from interviewer-administered to ACASI. ACASI provides respondents with complete privacy regarding both the question being asked and the answers that they give, immediately encrypting their responses so that no one can link answers to the identity of individual respondents (Couper, Tourangeau, and Marvin 2009; Groves et al. 2009b; Turner et al. 1998). Specific wording used in the NSFG measures and a discussion of issues related to respondent interpretation of the questions is available in the Appendix.

The NSFG also uses responsive survey design (RSD) – an approach that adjusts survey field work procedures in real-time to maximize the efficiency and quality of the data collected (Groves and Heeringa 2006). The NSFG uses RSD both to maximize participation in the study in a cost-efficient manner and to ensure balanced participation across key subgroups of the U.S. population, such as men, women, Hispanic Americans and African Americans (Axinn, Link, and Groves 2011; Groves and Heeringa 2006; Lepkowski et al. 2013; Wagner et al. 2012). RSD uses data about the data collection process [also called ‘paradata’ (Kreuter 2013)] to make careful adjustments in the field procedures (e.g., applying more effort to subgroups having lower response rates). The aim is to improve key data collection outcomes, such as the response rate or the balance in response rates across key subgroups (Axinn, Link, and Groves 2011; Groves and Heeringa 2006).

In 2002, the NSFG interviewed a national area probability sample of 12,571 respondents 15–44 years of age – 7,643 females and 4,928 males. The interviews were voluntary and confidential. The response rate was 79% overall – 80% for females and 78% for males. Between 2011 and 2013, the NSFG interviewed a national sample of 10,416 respondents 15–44 years of age. The response rate was 72.8% overall – 73.4% for females and 72.1% for males. To analyze these NSFG data, which are freely available for public use, we generated

SAS code that would account for the complex design features of the NSFG sample and the correct NSFG sample design weights (the SAS code used is available upon request).

Outcome Measures

There are *limitations* of the NSFG-based data for studies of sexual assault. The NSFG does not ask a wide range of questions about sexual assault. It does not ask about unwanted touching, kissing, fondling, removal of clothes, or incapacitation. Studies of college campuses indicate that more than half of all sexual assaults involve these other behaviors and not forced intercourse, so the NSFG data only speak to one part of sexual assault (Cantor et al. 2015; Kilpatrick et al. 2007; Krebs et al. 2009). The NSFG does not ask specifically about unwanted oral, anal, or vaginal penetration that may not involve intercourse. Thus, the NSFG measures are likely to underestimate total assault, potentially by a large fraction. The NSFG does not ask about sexual harassment or stalking and it does not distinguish between intimate partner violence (IPV) or attacks by strangers. However, the NSFG does ask a fully representative sample of the general population of the United States aged 18–44 simple, single-dimension questions about forced intercourse (people aged 15–17 are not asked these questions), and these measures are collected repeatedly from independent national samples over time.

Although all NSFG measures are subject to the possibility of misunderstanding by respondents, the measures are rigorously tested by the National Center for Health Statistics, including extensive cognitive interviewing and laboratory work, before being included in the survey (Hamby 1998). Likewise, all surveys that fail to achieve 100% response rates are vulnerable to the possibility that those who elect not to participate are systematically different than those who do participate. The NSFG generally delivers response rates in excess of 70%, placing it among the highest achieving national face-to-face surveys in the U.S. (Lepkowski et al. 2013), and public-use NSFG data files include respondent weights that adjust estimates for nonresponse.

Thus a key limitation of the NSFG is that measures of sexual assault are limited to only measures of forced intercourse. As described above, forced intercourse represents just under half of all sexual assaults, but it is a severe form of sexual assault with many associated health risks and with potential for long term adverse consequences (Brener et al. 1999; Cantor et al. 2015; Krebs et al. 2009). The use of NSFG data to investigate forced intercourse does not provide direct information on sexual assaults in general, but it does advance our understanding of a large and important subset of sexual assaults.

Analytic Approach

In all analyses, we used the NSFG respondent weights for unbiased estimation of features of the target population, and we used the publically available sample design variables to compute standard errors and confidence intervals reflecting the NSFG's complex sample design (Lepkowski et al. 2013). We first generated descriptive estimates of the percentages of different subgroups defined by age and gender ever experiencing forced intercourse in 2002 and 2011–2013.

Next, to estimate the association between the cumulative experience of college attendance and rates of ever experiencing forced intercourse, we focused on men and women aged 25–29; these are the ages by which most Americans with college experience have finished attending college. This approach allowed us to compare the cumulative total experience of ever being forced to have intercourse across different levels of completed college experience. We also investigated the same difference in the cohort of people between the ages of 30–44 as a check on the robustness of our results for different age cohorts.

The NSFG provides a categorical measure of college attendance experience – no college attendance, some college attendance but less than four years, and four or more years of college attendance. We treat these categories as distinct levels of exposure to risk of sexual assault because they represent different durations of exposure to college attendance (the highest degree completed does not). We started by fitting simple logistic regression models and estimating crude odds ratios (and 95% confidence intervals) comparing these three different subgroups defined by experience attending college (none, less than four years, and four or more years) in terms of lifetime experiences of forced intercourse.

Finally, the NSFG provides information on many potential confounders of the college experience/forced intercourse relationship. These include race/ethnicity, mothers' education, mothers' work experience, mothers' ages at first birth, whether respondents lived with both parents from birth, and religious affiliation in childhood. Prior research demonstrates that each of these factors affect the subsequent odds of attending college (Grusky, Kanbur and Sen 2006; Hauser and Featherman 2013; Sewell, Haller and Portes 1969). Note, however, that the NSFG measures do not provide the means to adjust for all of the potential selection factors identified in our theoretical framework, including pre-college age experiences with intoxication or sexual assault. We added measures of these characteristics to multivariate logistic regression models, providing some statistical adjustment for the relationships of these covariates with forced intercourse (see the Appendix for detailed descriptions of these measures). Although this approach makes use of all the information that is available on these potential confounders in the public-use NSFG data, it is in no way adequate to completely remove the possibility that differences before or after college explain the observation of differences in experience of forced intercourse by levels of college experience (Imbens and Rubin 2015; Sobel 2000). Our main focus is on the magnitude of this association and how it changes once these pre-existing factors are added to the model.

Results

Estimated Rates of Forced Intercourse

We estimate that 20% of U.S. women aged 18–44 have ever been forced to have vaginal intercourse (Table 1). This number agrees with estimated rates of sexual assault in college campus populations reported in the popular press (Anderson and Clement 2015). However, this similarity in the estimate reflects a much different measurement of the population. First, the NSFG measures *lifetime experience*, not experience in the past year or experience since enrollment in college as in many other studies. Second, our NSFG estimate is for women *between the ages of 18–44*, not college-age women. Third, the NSFG estimate is only for *forced intercourse*, which studies of both the national population (Sinozich and Langton

2014) and college campuses (Cantor et al. 2015) indicate characterizes just under half of all sexual assaults. The rates of total experience with sexual assault are likely much higher.

During the decade between 2002 and 2012, this percentage has not dropped, remaining at approximately 20% based on the 2011–2013 NSFG data. Men have also had this experience, albeit at a lower rate (Table 1). In 2002, an estimated 7.6% of men reported this experience in their lifetime. Forced intercourse for men includes both vaginal intercourse forced by women and oral or anal intercourse forced by men. The rate at which men reported having had this experience declined slightly from 2002 to 2012. Overall, these high rates of experiencing forced intercourse appear relatively stable in the general population in recent history.

The finding that lifetime experiences of forced intercourse increase with age is not surprising; individuals have an increased exposure to the risk of such an event with time. For women in both time periods, the reports of this experience increased nearly monotonically with age, with *more than 25% reporting having ever been forced to have vaginal intercourse by ages 40–44* (Table 1). Again, because forced intercourse represents less than half of all sexual assaults, the total percentage of the population experiencing any form of sexual assault is likely much higher. For men, however, the change across age groups is not a monotonic increase. In both time periods, the total ever experiencing forced intercourse changes in both directions across age groups, which may reflect slight birth cohort differences in this experience (Shryock and Siegel 1976).

Types of Force Experienced

The NSFG data also include respondent reports of the types (kinds) of force used. Every female respondent who reported ever having been forced to have sex (including those indicating non-voluntary first intercourse) was asked a follow-up set of questions about “kinds of force” used during the incident. Here we present results from analyses of the “kinds of force” reported in the NSFG 2011–2013 data. Table 2 presents weighted estimates of percentages of females indicating certain kinds of force (and standard errors for the percentages), calculated for females age 18 and older who indicated that they had ever been forced to have sex or that their first sexual intercourse was not voluntary. Females were asked the follow-up set of questions about kinds of force used *only once* during the ACASI portion of the interview, even if they answered affirmatively to both questions (see Appendix). As a result, frequencies displayed in this table may refer to either the female’s first non-voluntary intercourse or to a later event when she was forced to have intercourse. Females who indicated that their first intercourse was not voluntary, that they did not want first intercourse to happen at the time, or that they had mixed feelings about first intercourse were asked the “kinds of force” set of questions regarding their first sexual intercourse. Every respondent could report as many different kinds of force as she believed matched her experience.

The analyses of these measures indicate that for females, *verbal pressure* was the most frequently reported kind of force, followed by physical or age intimidation and being physically held down. Given the wording of these “kinds of force” follow-up questions in Table 2, respondents may have had a difficult time distinguishing between “pressured by

actions” and “physically held down,” but they were able to check all items that applied to their experience.

The male ACASI instrument did not include the same type of skip pattern as the female instrument. Males could be asked the “kinds of force” question set after the questions about both male force and female force. Males were not queried about “kinds of force” following questions about first intercourse, largely due to the historical focus of the NSFG on reproductive health among females. Collectively, however, the results tell a similar story: regardless of the set of respondents or the experiences ultimately leading to an affirmative answer of ever experiencing forced intercourse, *verbal pressure* is always the most commonly cited kind of force involved in these outcomes (not shown in tables). We repeated these analyses for the different subgroups defined by cumulative college experience, and we found that the kinds of force mentioned above were still the most commonly cited kinds, regardless of cumulative college experience.

College Attendance and Forced Intercourse

For those aged 25–29, the NSFG data indicate that women who either never attended college or who attended only one to three years of college were *more than twice as likely* to have ever experienced forced intercourse compared to women who attended four or more years of college (Table 3). If we translate this difference into a ratio of odds, we see that the odds of forced intercourse were 2.7 times higher for those without four years of college [$OR = (0.224/0.776)/(0.098/0.902) = 2.7$, 95% CI = (1.4, 4.9)] compared to those with four or more years of college. The 95% confidence interval for the odds ratio (OR) indicates that this difference was statistically significant at the 5% level (an odds ratio of 1.0 would correspond to the null hypothesis of no difference between the groups, and the 95% confidence interval does not include 1.0). Among men, the pattern is even more strongly pronounced. For men aged 25–29, the NSFG data indicate that men who either never attended college or who attended only one to three years of college were approximately *four times more likely* to have ever experienced forced intercourse compared to men who attended four or more years of college, and 95% confidence intervals for these odds ratios (not shown) do not include 1.0, indicating that these differences were significant at the 5% level as well.

Next, considering those aged 30–44, the differences between those who complete four or more years of college and those who have not were smaller, but those with more college completion still had significantly lower odds of ever experiencing forced intercourse [e.g., comparing women with no college experience to those with four years of college, we have $OR = (0.252/0.748)/(0.170/0.830) = 1.6$, 95% CI = (1.1, 2.5); see columns 2 and 4 of Table 3]. It is possible that the lower odds of forced intercourse for those with four or more years of college in this age group reflect a temporary difference that dissipates as people get older.

Adjustment for Selection Factors before Exposure to College

A key issue identified in our guiding theoretical framework is the potential of pre-existing factors to shape the decision to attend college, thereby shaping the association between college attendance and experiences of sexual assault, including forced intercourse. The measures available in the NSFG allow us to adjust the estimates of this association for a

small number of factors that characterize the respondents' early childhoods, before any choices are made about college attendance. The next analysis uses multivariate models to adjust our estimates of the association between college attendance and lifetime experience of forced intercourse for these pre-existing characteristics.

Adjusting for these prior factors that shape college attendance in our logistic regression models, we found that women who completed less than four years of college by age 25–29 still had approximately two and a half times higher odds of experiencing forced vaginal intercourse compared to women who completed four or more years of college. These adjusted differences remained significant at the 5% level for the group of women with less than four years of college [OR for 1–3 years college = 2.69; see Table 4]. Even after adjusting for these early childhood circumstances, women with less than four years of college still had more than *two and a half times higher odds* of ever experiencing forced intercourse than women with four or more years of college (Table 4).

Among men, adjustment for early life factors left the association between college attendance and forced intercourse substantively large, but not statistically significant. Despite the lack of statistical significance at the 0.05 level, the magnitude of this difference was still notable: Men with less than four years of college had four times higher odds of experiencing sexual assault than men with four or more years of college. Due to small sample size considerations, we did not examine interactions between college attendance and the other confounding factors evaluated in our multivariate models. Investigation of possible interactions between college attendance and these other factors based on larger samples is an important direction for future research in this area.

Discussion

Sexual assault is appropriately being treated as a major social issue, a public health and safety priority, and a national concern. Accordingly, health science is beginning to investigate approaches for reducing this significant population health risk (Senn et al. 2015). The experience of forced intercourse has particularly high potential for long term adverse health consequences (Brener et al. 1999). Even though forced intercourse represents less than half of all sexual assaults, analyses of the NSFG data presented here reveal that 25% of U.S. women have experienced forced intercourse by ages 40–44. Given the substantial health and wellbeing risks associated with this experience, this high rate of forced intercourse looms as a substantial national health risk. The NSFG measures provide the means to assess changes over time in the rate of forced intercourse, and from 2002 to 2012, this high rate of forced intercourse for American women did not decline.

College Students

Many different kinds of studies of college students in the U.S. all point to high rates of sexual assault among students (Cantor et al. 2015; Fedina, Holmes, and Backes 2016; Krebs et al. 2009; Lawyer et al. 2010). This is true and it is an important problem facing U.S. higher education. What we show here is that those high rates among college students are not a complete story – the rates of this experience are *even higher* among those who never attend college, when adjusting for other relevant covariates. This result is alarming, because it

means that a national focus on students enrolled in college is not enough to address the nationally high levels of this experience. Of course this does not mean that science or policy should abandon work on students enrolled in college.

In many ways, college students are an ideal population for research on both process dynamics and potential interventions. College students are a well-defined population, they are under relatively high scrutiny, and the resources in their daily environment (student programs, dormitories, classrooms) provide ready avenues to test interventions. Research among college students is beginning to identify interventions to reduce the risk of forced intercourse (Senn et al. 2015). The high prevalence in this population indicates that more work needs to be done. Detailed longitudinal research documenting the population prevalence of specific processes leading to sexual assault is a high priority in order to inform new approaches to intervention.

The results that we report here are consistent with the conclusion that research on college students may be necessary, but it is not sufficient. In addition to research on college students, research on appropriate interventions for young people who do not attend college needs to be a general population health priority. Efforts to reduce these high rates of forced intercourse throughout the U.S. adult population will demand that scientific advances in preventative measures be applied throughout the population, and not just on college campuses. In fact, the high prevalence of experiencing forced intercourse at young ages means these efforts will also need to target teens who are not yet adults.

National Data

National data on the general population is an important resource to guide our understanding of the problem, variations in the problem across important sub-groups of the population, and the potential for specific interventions to address the problem. The United States has three different important sources of ongoing national data on sexual assault. These are the Department of Justice's National Crime Victimization Survey (NCVS), the National Survey of Family Growth (NSFG) analyzed here, and the Center for Disease Control's National Intimate Partner and Sexual Violence Survey (NISVS). Unfortunately, all three of these resources are characterized by crucial limitations. First, as discussed above, a key concern with measurement from the NCVS is identified in the National Research Council review of the methodological issues surrounding the survey measurement of sexual assault – surveys that ask about sexual assault in a criminal behavior or experience context may underestimate the prevalence of sexual assault (National Research Council 2014). Second, as we described in detail, the NSFG currently only measures forced intercourse, limiting the ability of those data to measure the full extent of sexual assault. Third, though the NISVS targets this specific topic, it is conducted using telephone interviews, which have become a poor representation of the U.S. population because they generate very low response rates (Blumberg and Luke 2007; Brick and Williams 2013; Curtin, Presser and Singer 2005). The NISVS may also be subject to some of the same downward biasing context effects identified by the National Research Council for NCVS. With no perfect study available, and rates of lifetime experience for forced intercourse reaching 1 in 4 U.S. women, investment in new research tools at the national level looms as another important scientific priority.

These limitations create a high priority on using all three of these data sources to create the most comprehensive possible understanding of the general population. These national measures provide important resources for understanding sexual assault in the United States. Data from the NCVS show that in the same age group, young people enrolled in college have *lower odds* of experiencing sexual assault than young people who are not enrolled in college. The NSFG data we analyze here demonstrate that at older ages, those who have had four or more years of college have *lower odds* of experiencing forced intercourse than those with less college experience. These two studies are different, complementary, and yield a strong indication that the issue of high exposure to sexual assault and forced intercourse is greater for those who have less college experience than it is for those who have more college experience. Together, these results indicate that the problematic high prevalence of sexual assault and forced intercourse in the U.S. is just as common among those who have little or no college enrollment. At the national level, this is strong evidence that programs to assist those who are not in college deserve substantial attention.

But even in the design of programs to reduce these risks among college students, national data are an important resource. For example, here we use NSFG data to document the high rate at which those who experience forced intercourse describe verbal pressure as a common form of force. This result indicates that general interventions designed to lower rates of forced intercourse must address verbal force as well as other forms of force. Campus-specific data from the University of Michigan found a similar result among victims of all forms of sexual assault (University of Michigan 2015). That survey was the only recent study of college students to measure verbal pressure as a distinct circumstance – it shows that in that specific college student population, verbal pressure is a circumstance mentioned just as frequently as intoxication. In that study verbal pressure was described to respondents as “... continually verbally pressuring you after you said you didn’t want to? This includes telling lies, threatening to end the relationship, threatening to spread rumors about you, showing displeasure, criticizing your sexuality or attractiveness, or getting angry but not using physical force.” (Survey Sciences Group 2015, p. 11) Many campus specific programs to reduce sexual assault among college students focus on intoxication as a common circumstance for assaults. Campus data reveal that it indeed is (Cantor et al. 2015; University of Michigan 2015), but these types of verbal pressuring appear common as well, and likely deserve careful attention in on-campus programs.

Processes of College Experience and Sexual Assault

Cross-sectional data such as the NSFG data we analyze here are notoriously poor sources of information on the processes occurring over time that produce strong associations between circumstances like college enrollment and sexual experiences like assault or forced intercourse. Using the NSFG data, we document significantly lower rates of forced intercourse among those who complete four or more years of college, but many different processes may produce this result. Prior experience with assault or forced intercourse may reduce the likelihood of ever going to college (selection), experiences of assault or forced intercourse may lead enrolled students to leave college before they finish (selection), completing four years of college may delay entry into courtship, delaying exposure to the risk of forced intercourse (causation), or something about completing four or more years of

college, such as exposure to campus programs, may actually reduce the lifetime odds of ever experiencing forced intercourse (causation). Most likely both selection and causation are involved in producing the strong association that we observe in the NSFG data (Axinn and Thornton 1992).

In fact, these selection and causation dynamics may operate across a wide range of factors related to the likelihood of sexual assault. For example, consider poverty. Large, population-representative studies in both the U.S. and England document a strong association between having low household income and the risk of experiencing sexual assault (Planty et al. 2013; Walby and Allen 2004). We know that poverty is linked to college attendance processes across time, such that children raised in low income households are less likely to attend college in early adulthood, but also such that young adults who attend college go on to higher income streams and lower risk of experiencing poverty (Grusky, Kanbur and Sen 2006; Hauser and Featherman 2013; Sewell, Haller and Portes 1969). The observed associations between poverty and sexual assault and college attendance and sexual assault may not be independent. However, to document the connections among these processes scientists will need multiple measures across time because of the dynamic processes linking these experiences to each other.

To document these processes and understand the potential for college completion to reduce the odds of forced intercourse will require a comprehensive longitudinal study of the dynamic association between experience attending college and forced intercourse. Such a study would require measurement of an even broader range of childhood characteristics and careful longitudinal study of both sexual and college experiences over many years following childhood. Analyses of the best longitudinal study of sexual experience currently available for the U.S. population indicate that early life forced intercourse reduces the odds of subsequent college attendance (Rees and Sabia 2013). More longitudinal research on this important health risk is urgently needed to more fully understand the dynamics associated with forced intercourse experience.

Conclusion

Forced intercourse appears to be an issue that is pervasive throughout the U.S. population, and not one that is isolated to those completing four or more years of college. We report evidence that four or more years of college attendance are associated with significantly lower odds of lifetime experiences of forced intercourse in the general U.S. adult population. Although studies of college student populations demonstrate that sexual assault is common, the NSFG data indicate that forced intercourse is even more common among those who attend little or no college. National efforts to address either forced intercourse, or a broader range of sexual assaults, that limit interventions solely to campuses are unlikely to produce an end to this problem.

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Appendix

A. Exact Question Wording and Possible Respondent Interpretation

1. Specific Wording of NSFG Questions about Forced Intercourse

- Women were asked the following two questions:
 - “Would you say then that this first vaginal intercourse was voluntary or not voluntary, that is, did you choose to have sex of your own free will or not?”
 - “(At any time in your life/Besides the time you already reported), have you ever been forced by a male to have vaginal intercourse against your will?”
- Men were asked the following two questions:
 - “At any time in your life, have you ever been forced by a female to have vaginal intercourse against your will?”
 - “At any time in your life, have you ever been forced by a male to have oral or anal sex against your will?”

2. Background on Possible Respondent Interpretation

The National Center for Health Statistics mounted a significant study of respondent interpretation of the NSFG questions measuring forced or non-voluntary intercourse as part of the design of the 2002 NSFG. The study included thorough review of existing research on the topic along with substantial focus group research on respondent interpretation of questions about sexual assaults. The report on that study is titled, “Development of Measures of Nonvoluntariness of First Sexual Intercourse for Inclusion in the National Survey of Family Growth Cycle 6 Questionnaire” and was completed in 1998 by Sherry L. Hamby, Ph.D. (under Personal Services Contract number 0009830318). The report makes several recommendations, including the use of ACASI for measurement of forced or non-voluntary intercourse. On the topic of respondent interpretation, this report specifically states the following:

“d) We recommend that the NSFG continue to avoid using terms like “rape,” or “abuse,” as there is strong evidence that many victims do not think about their experiences in those terms” (Hamby 1998, p. 2).

The report also provides detailed accounting of various respondent interpretation issues from the focus group research conducted for this study. The report itself is available upon request from the NSFG Staff at the National Center for Health Statistics.

We note that the historical focus of the NSFG on fertility and reproductive health motivates the emphasis on forced vaginal intercourse for women (Williams, Brett, and Abma 2009). Men were added to the NSFG beginning in 2002, and the different question wording used for men reflects differences in male experiences.

B. NSFG Data Sets and Questionnaires

The NSFG data used in the analyses reported here are available at the links provided below. Please note that restricted-use (ACASI) data are available upon request from the National Center for Health Statistics.

- The 2002 NSFG data are available at: http://www.cdc.gov/nchs/nsfg/nsfg_cycle6.htm#cyc6downdatafiles
- The 2011–2013 NSFG data are available at: http://www.cdc.gov/nchs/nsfg/nsfg_2011_2013_puf.htm#downloadable

The 2002 and 2011–2013 NSFG questionnaires are available at:

- http://www.cdc.gov/nchs/nsfg/nsfg_2002_questionnaires.htm
- http://www.cdc.gov/nchs/nsfg/nsfg_2011_2013_questionnaires.htm

C. Exact Wording of NSFG Follow-up Questions (“Kinds of Force” Question Set)

The following questions were asked of men and women after NSFG interviewers asked the sets of questions about forced intercourse indicated above. Respondents were allowed to answer yes to as many of the following circumstances as applied to their history.

- “Were any of these kinds of force used?”
 - ☐ Were you given alcohol or drugs?
 - ☐ Did you do what he said because he was bigger than you or a grown-up, and you were young?
 - ☐ Were you told that the relationship would end if you didn’t have sex?
 - ☐ Were you pressured into it by his words or actions, but without threats of harm?
 - ☐ Were you threatened with physical hurt or injury?
 - ☐ Were you physically hurt or injured?
 - ☐ Were you physically held down?

D. Detailed Description of NSFG Measures Used to Adjust for Selection (Analysis in Table 4)

The exact wordings of the NSFG questions used for the selection analyses presented in Table 4, including weighted percentages (and design-adjusted standard errors), are provided below:

- *Race/Ethnicity*: Are you Hispanic or Latina, or of Spanish origin? 20.4% (2.4)
- *Race/Ethnicity*: Which of the groups on Card 2 describe your racial background?
 - ☐ Non-Hispanic Black: 12.0% (1.6)
 - ☐ Non-Hispanic Other or Multiple Race: 9.3% (1.5)
 - ☐ Non-Hispanic White Single Race: 58.4% (2.5)
- Religion: Now I have a few questions about religion. In what religion were you raised, if any? (Yes to any religion) 90.1% (1.2)
- Mother's Education: What is the highest level of education your mother completed?
 - ☐ High School Diploma/GED or less: 50.3% (1.6)
 - ☐ Some College: 24.8% (1.7)
 - ☐ BA or More: 24.9% (1.5)
- *Mother's Work*: During most of the time you were growing up, that is when you were between the ages of 5 and 15, did she usually work full time, part time or did she not work for pay at all? (full or part-time) 77.2% (1.7)
- *Two Parents from Birth*: Between your birth or adoption and (the present time/the time you first started living on your own/your 18th birthday), (have you always lived/did you always live) with both your (biological/adoptive) mother and (biological/adoptive) father? 59.3% (1.6)
- *Mother's Births*: How old was she when she had her first child who was born alive? (19 or younger) 30% (1.8)

References

- Abbey A. Alcohol-related sexual assault: a common problem among college students. *Journal of Studies on Alcohol, Supplement*. 2002; (s14):118–128. [PubMed: 12022717]
- Abbey, A., Ross, LT., McDuffie, D. Alcohol's Role in Sexual Assault. In: Watson, RR., editor. *Addictive behaviors in women*. 5th. Clifton, NJ: Humana Press; 1994. p. 97-123.
- Anderson, N., Clement, S. College sexual assault: 1 in 5 college women say they were violated. *The Washington Post*. 2015. Retrieved from <http://www.washingtonpost.com/sf/local/2015/06/12/1-in-5-women-say-they-were-violated/>
- Anderson, N., Svrluga, S. What a massive sexual assault survey found at 27 top U.S. universities. *The Washington Post*. 2015. Retrieved from <https://www.washingtonpost.com/news/grade-point/wp/2015/09/21/what-a-massive-sexual-assault-survey-showed-about-27-top-u-s-universities/>
- Armstrong EA, Hamilton L, Sweeney B. Sexual assault on campus: a multilevel, integrative approach to party rape. *Social Problem*. 2006; 53(4):483–499.

- Axinn WG, Link CF, Groves RM. Responsive survey design, demographic data collection, and models of demographic behavior. *Demography*. 2011; 48(3):1127–1149. [PubMed: 21706256]
- Axinn WG, Thornton A. The relationship between cohabitation and divorce: selectivity of causal influence? *Demography*. 1992; 29(3):357–374. [PubMed: 1426434]
- Bay-Cheng LY, Eliseo-Arras RK. The making of unwanted sex: gendered and neoliberal norms in college women's unwanted sexual experiences. *Journal of Sex Research*. 2008; 45(4):386–97. [PubMed: 18937130]
- Belli RF. The structure of autobiographical memory and the event history calendar: potential improvements in the quality of retrospective reports in surveys. *Memory*. 1998; 6(4):383–406. [PubMed: 9829098]
- Blumberg SJ, Luke JV. Coverage bias in traditional telephone surveys of low-income and young adults. *Public Opinion Quarterly*. 2007; 71(5):734–49.
- Boswell AA, Spade JZ. Fraternities and collegiate rape culture: why are some fraternities more dangerous places for women? *Gender and Society*. 1996; 10(2):133–47.
- Brener ND, McMahon PM, Warren CW, Douglas KA. Forced sexual intercourse and associated health risk behaviors among female college students in the United States. *Journal of Consulting and Clinical Psychology*. 1999; 67(2):252–259. [PubMed: 10224736]
- Brick JM, Williams D. Explaining rising nonresponse rates in cross-sectional surveys. *The ANNALS of the American Academy of Political and Social Science*. 2013; 645(1):36–59.
- Bumpass LL, Sweet JA. National estimates of cohabitation. *Demography*. 1989; 26(4):615–625. [PubMed: 2583320]
- Cantor, D., Fisher, B., Chibnall, S., Townsend, R., Hee, H., Bruce, C., Thomas, G. Report on the AAU campus climate survey on sexual assault and sexual misconduct. Rockville, MD: Westat; 2015. Retrieved from https://www.aau.edu/uploadedFiles/AAU_Publications/AAU_Reports/Sexual_Assault_Campus_Survey/AAU_Campus_Climate_Survey_12_14_15.pdf
- Center for Behavioral Health Statistics and Quality. Results from the 2013 national survey on drug use and health: Detailed tables. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2014.
- Chandra, A., Martinez, GM., Mosher, WD., Abma, JC., Jones, J. Fertility, family planning, and reproductive health of US women: data from the 2002 National Survey of Family Growth. Vol. 23. National Center for Health Statistics; 2005. Vital and Health Statistics
- Cohen LE, Felson M. Social change and crime rate trends: a routine activity approach. *American Sociological Review*. 1979; 44(4):588–608.
- Copenhaver S, Grauerholz E. Sexual victimization among sorority women: exploring the link between sexual violence and institutional practices. *Sex Roles*. 1991; 24(1–2):31–41.
- Couper MP, Tourangeau R, Marvin T. Taking the audio out of audio-CASI. *Public Opinion Quarterly*. 2009; 73(2):281–303.
- Curtin R, Presser S, Singer E. Changes in telephone survey nonresponse over the past quarter century. *Public Opinion Quarterly*. 2005; 69(1):87–98.
- Fedina L, Holmes JL, Backes BL. Campus sexual assault: a systemic review of prevalence research from 2000 to 2015. *Trauma, Violence, Abuse*. 2016; doi: 10.1177/1524838016631129
- Goldscheider, F., Goldscheider, C. The changing transition to adulthood: Leaving and returning. Thousand Oaks, CA: Sage; 1999.
- Gross AM, Winslett A, Roberts M, Gohm CL. An examination of sexual violence against college women. *Violence Against Women*. 2006; 12(3):288–300. [PubMed: 16456153]
- Groves, RM., Fowler, FJ., Jr, Couper, MP., Lepkowski, JM., Singer, E., Tourangeau, R. Survey methodology. 2nd. New York: Wiley; 2009b.
- Groves RM, Heeringa SG. Responsive design for household surveys: tools for actively controlling survey errors and costs. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*. 2006; 169(Part 3):439–457.
- Groves, RM., Mosher, WD., Lepkowski, JM., Kirgis, NG. Planning and development of the continuous National Survey of Family Growth. Vol. 1. National Center for Health Statistics; 2009a. Vital and Health Statistics

- Grusky, DB., Kanbur, R. Poverty and inequality. Stanford: Stanford University Press; 2006.
- Hamby S. Development of measures of nonvoluntariness of the first sexual intercourse for inclusion in the National Survey of Family Growth Cycle 6 Questionnaire: Final Report. 1998 Dec. Contract No. 00098303180.
- Hauser, RM., Featherman, DL. The process of stratification: Trends and analyses. New York: Academic Press; 2013.
- Imbens, GW., Rubin, DB. Causal inference in statistics, social, and biomedical sciences. Chicago, IL: Cambridge University Press; 2015.
- Johnston, LD., O'Malley, PM., Bachman, JG., Schulenberg, JE., Miech, RA. Monitoring the Future national survey results on drug use, 1975–2014: Volume II, College students and adults ages 19–55. Ann Arbor, MI: Institute for Social Research, The University of Michigan; 2015. Retrieved from http://www.monitoringthefuture.org/pubs/monographs/mtf-vol2_2014.pdf
- Kalof L. Rape-supportive attitudes and sexual victimization experiences of sorority and nonsorority women. *Sex Roles*. 1993; 29(11–12):767–80.
- Kilpatrick, DG., Resnick, HS., Ruggiero, KJ., Conoscenti, LM., McCauley, J. Drug-facilitated, incapacitated, and forcible rape: a national study. 2007. Document No. 219181 Retrieved from <https://www.ncjrs.gov/pdffiles1/nij/grants/219181.pdf>
- King G, Flisher AJ, Noubary F, Lombard C. Substance abuse and behavioral correlates of sexual assault among South African adolescents. *Child Abuse & Neglect*. 2004; 28(6):683–696. [PubMed: 15193855]
- Kitzinger C, Frith H. Just Say No? The use of conversation analysis in developing a feminist perspective on sexual refusal. *Discourse & Society*. 1999; 10(3):293–316.
- Krebs, CP., Lindquist, CH., Warner, TD., Fisher, BS., Martin, SL. The campus sexual assault (CSA) study. 2007. (No. 221153). Retrieved from <https://www.ncjrs.gov/pdffiles1/nij/grants/221153.pdf>
- Krebs CP, Lindquist CH, Warner TD, Fisher BS, Martin SL. College women's experiences with physically forced, alcohol- or other drug-enabled, and drug-facilitated sexual assault before and since entering college. *Journal of American College Health*. 2009; 57(6):639–647. [PubMed: 19433402]
- Kreuter, F., editor. Improving surveys with paradata: analytic uses of process information. New York, NY: Wiley; 2013.
- Lawyer S, Resnick H, Bakanic V, Burkett T, Kilpatrick D. Forcible, drug-facilitated, and incapacitated rape and sexual assault among undergraduate women. *Journal of American College Health*. 2010; 8(5):453–460.
- Lepkowski, JM., Mosher, WD., Groves, RM., West, BT., Wagner, J., Gu, H. Responsive design, weighting, and variance estimation in the 2006–2010 National Survey of Family Growth. Vol. 2. National Center for Health Statistics; 2013. Vital and Health Statistics
- Martins SS, Kim JH, Chen LY, Levin D, Keyes KM, Cerdá M, Storr CL. Nonmedical prescription drug use among U.S. young adults by educational attainment. *Social Psychiatry and Psychiatric Epidemiology*. 2015; 50(5):713–724. DOI: 10.1007/s00127-014-0980-3 [PubMed: 25427665]
- National Research Council. Estimating the Incidence of Rape and Sexual Assault. In: Kruttschnitt, C.Kalsbeek, WD., House, CC., editors. Panel on Measuring Rape and Sexual Assault in Bureau of Justice Statistics Household Surveys. Committee on National Statistics, Division of Behavioral and Social Sciences and Education; Washington, DC: The National Academies Press; 2014.
- Obama, B. Memorandum – Establishing a White House task force to protect students from sexual assault. Washington, DC: White House; 2014. [Press release] Retrieved from <https://www.whitehouse.gov/the-press-office/2014/01/22/memorandum-establishing-white-house-task-force-protect-students-sexual-a>
- Patrick ME, Schulenberg JE, O'Malley PM. High school substance use as a predictor of college attendance, completion, and dropout. *Youth & Society*. 2016; 48(3):425–447. [PubMed: 27134316]
- Planty, M., Langton, L., Krebs, C., Berzofsky, M., Smiley-McDonald, H. Female victims of sexual violence, 1994–2010. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics; 2013. Special Report NCJ 240655 Retrieved from <https://www.bjs.gov/content/pub/pdf/fvsv9410.pdf>

- Rees DI, Sabia JJ. Forced intercourse, mental health, and human capital. *Southern Economic Journal*. 2013; 80(2):324–344.
- Rennison CM, Addington LA. Violence against college women: A review to identify limitation in defining the problem and inform future research. *Trauma, Violence, & Abuse*. 2014; 15(3):159–169.
- Russell, DE. Rape in marriage. New York, NY: Macmillan; 1982.
- Ryder NB, Westoff CF. Use of oral contraception in the United States, 1965. *Science*. 1966; 153(3741):1199–1205. [PubMed: 5918709]
- Senn CY, Eliasziw M, Barata PC, Thurston WE, Newby-Clark IR, Radtke L, Hobden KL. Efficacy of a sexual assault resistance program for university women. *New England Journal of Medicine*. 2015; 372:2326–2335. [PubMed: 26061837]
- Sewell WH, Haller AO, Portes A. The educational and early occupational attainment process. *American Sociological Review*. 1969; 34(1):82–92.
- Schwarz, N., Sudman, S., editors. *Autobiographical memory and the validity of retrospective reports*. New York, NY: Springer Verlag; 1994.
- Sherman LW, Gartin PR, Buerger ME. Hot spots of predatory crime: routine activities and the criminology of place. *Criminology*. 1989; 27(1):27–56.
- Shryock, H., Siegel, J. *The methods and materials of demography*. New York, NY: Academic Press; 1976.
- Sinozich, S., Langton, L. Rape and sexual assault among college-age females, 1995–2013. Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics; 2014. Special Report NCJ 248471 Retrieved from <http://www.bjs.gov/content/pub/pdf/rsavcaf9513.pdf>
- Sobel ME. Causal inference in the social sciences. *Journal of the American Statistical Association*. 2000; 95:647–651.
- Street AE, et al. Developing a risk model to target high-risk preventative interventions for sexual assault victimization among female U.S. army soldiers. *Clinical Psychological Science*. 2016; 4(6):939–956. [PubMed: 28154788]
- Survey Sciences Group. S14008 UM Campus Climate Survey. 2015. Retrieved from <http://publicaffairs.vpcomm.umich.edu/wp-content/uploads/sites/19/2015/04/Campus-climate-survey-questions.pdf>
- Thornton A, Axinn WG, Teachman J. The influence of school enrollment and accumulation on cohabitation and marriage in early adulthood. *American Sociological Review*. 1995; 60(5):762–774.
- Thornton, A., Axinn, WG., Xie, Y. *Marriage and cohabitation*. Chicago, IL: University of Chicago Press; 2007.
- Tjaden P, Thoennes N. Prevalence and consequences of male-to-female and female-to-male intimate partner violence as measured by the National Violence Against Women Survey. *Violence Against Women*. 2000; 6(2):142–161.
- Turner CF, Ku L, Rogers SM, Lindberg LD, Pleck JH, Sonenstein FL. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science*. 1998; 280(5365):867–873. [PubMed: 9572724]
- Tyler KA, Hoyt DR, Whitbeck LB. Coercive sexual strategies. *Violence and Victims*. 1998; 13(1):47–61. [PubMed: 9650245]
- Ullman SE, Karabatsos G, Koss MP. Alcohol and sexual assault in a national sample of college women. *Journal of Interpersonal Violence*. 1999; 14(6):603–625.
- United States Department of Education. U.S. Department of Education releases list of higher education institutions with open Title IX sexual violence investigations. 2014. [Press release]. Retrieved from <http://www.ed.gov/news/press-releases/us-department-education-releases-list-higher-education-institutions-open-title-i>
- University of Michigan. Results of 2015 University of Michigan Campus Climate Survey on Sexual Misconduct. 2015. Retrieved from <http://publicaffairs.vpcomm.umich.edu/wp-content/uploads/sites/19/2015/04/Complete-survey-results.pdf>

- Wagner J, West BT, Kirgis N, Lepkowski JM, Axinn WG, Kruger-Ndiaye S. Use of paradata in a responsive design framework to manage a field data collection. *Journal of Official Statistics*. 2012; 28(4):477–499.
- Walby, S., Allen, J. Home Office Research Study 276, Development and Statistics Directorate. London: 2004. Domestic violence, sexual assault, and stalking: findings from the British Crime Survey.
- Wechsler H, Davenport A, Dowdall G, Moeykens B, Castillo S. Health and behavioral consequences of binge drinking in college: a national survey of students at 140 campuses. *JAMA*. 1994; 272(21): 1672–1677. [PubMed: 7966895]
- The White House Council on Women and Girls. Rape and sexual assault: a renewed call to action. Washington, DC: Office of the Vice President; 2014. Retrieved from https://www.whitehouse.gov/sites/default/files/docs/sexual_assault_report_1-21-14.pdf
- Williams CM, Brett KM, Abma JC. Coercive first intercourse and unintended first births. *Violence and Victims*. 2009; 24(3):351–363. [PubMed: 19634361]

Table 1

NSFG-based Estimates of the Percentage of the U.S. Population Who Reported They Were “Ever Forced to Have Intercourse” (linearized standard errors are in parentheses)

	Female, 2002	Female, 2011–13	Male, 2002	Male, 2011–13
Age				
18–19	14.3 (1.7)	15.1 (2.7)	4.2 (1.0)	3.9 (1.0)
20–24	19.1 (1.5)	15.0 (1.8)	9.0 (1.3)	5.2 (0.9)
25–29	22.4 (1.8)	17.9 (1.8)	8.7 (1.6)	3.4 (0.8)
30–34	24.0 (1.6)	20.0 (1.9)	6.8 (1.0)	7.2 (1.4)
35–39	24.9 (1.5)	20.3 (2.0)	8.6 (1.5)	7.8 (1.5)
40–44	25.2 (1.8)	25.6 (2.2)	6.4 (1.3)	7.8 (1.6)
Total	22.6 (0.8)	19.5 (0.8)	7.6 (0.6)	6.0 (0.6)
N	6,937	4,962	4,429	4,130

Table 2

NSFG-based Estimates of the Percentage of Females Who Reported Specific “Kinds of Force Used” among Females Reporting an Experience of Forced Intercourse (each respondent could report as many kinds of force as experienced), 2011–2013^a

	Age 18+		Age 25 – 29		Age 30 – 44	
	Percent Among Any Forced (N=1,048)	SE	Percent Among Any Forced (N=220)	SE	Percent Among Any Forced (N=611)	SE
Were any of these kinds of force used?						
Were you given alcohol or drugs?						
Yes	21.79	1.84	31.60	5.07	20.40	2.17
No	77.89	1.83	68.15	5.13	79.17	2.18
Not Ascertained/R	0.32	0.18	0.25	0.24	0.43	0.27
Did you do what he said because he was bigger than you or a grown-up and you were young?						
Yes	33.33	2.29	29.99	4.26	33.47	2.55
No	66.10	2.31	69.77	4.23	65.68	2.62
Not Ascertained/R	0.57	0.25	0.25	0.24	0.85	0.40
Were you told that the relationship would end if you didn't have sex?						
Yes	12.19	1.50	14.49	3.43	11.48	2.08
No	87.11	1.55	85.27	3.41	87.59	2.17
Not Ascertained/R	0.70	0.30	0.25	0.24	0.93	0.44
Were you pressured into it by his words or actions, but without threats of harm?						
Yes	44.13	2.30	40.39	5.44	43.70	2.96
No	55.56	2.30	59.36	5.49	55.87	3.01
Not Ascertained/R	0.32	0.18	0.25	0.24	0.43	0.27
Were you threatened without physical hurt or injury?						
Yes	16.97	1.77	15.92	4.26	17.47	2.39
No	82.71	1.80	83.83	4.25	82.09	2.45
Not Ascertained/R	0.32	0.18	0.25	0.24	0.43	0.27
Were you physically hurt or injured?						
Yes	14.16	1.55	11.66	3.19	15.57	2.24
No	85.35	1.61	88.10	3.19	83.77	2.36
Not Ascertained/R	0.49	0.23	0.25	0.24	0.66	0.36

	Age 18+	Age 25 – 29	Age 30 – 44
	Percent Among Any Forced (N=1,048)	Percent Among Any Forced (N=220)	Percent Among Any Forced (N=611)
	SE	SE	SE
Were you physically held down?			
Yes	30.95	26.11	32.63
			3.57
No	68.45	73.65	66.53
			3.61
Not Ascertained/R	0.60	0.25	0.84
			0.40

^a Percentages and linearized standard errors (SE) among females who indicated they had ever been forced to have sex or their first sexual intercourse was not voluntary.

Boldface indicates the most common responses.

Table 3

NSFG-based Estimates of the Percentage of the U.S. Population Who Reported They Were “Ever Forced to Have Intercourse,” 2011–2013 (linearized standard errors are in parentheses)

Age	Female Only			Male Only		
	25–29 Years	Percent (SE)	N	30–44 Years	Percent (SE)	N
No College	22.4 (3.8)	408	25.2 (2.4)	981	4.4 (1.1)	371
Some College	22.8 (3.0)	358	24.5 (2.4)	730	4.2 (1.9)	260
4+ Yrs of College	9.8 (1.9)	294	17.0 (2.1)	805	1.1 (0.5)	216
Total	17.9 (1.8)	1,060	22.0 (1.1)	2,516	3.4 (0.8)	847
					7.6 (1.0)	2,049

Table 4
Multivariate Logistic Regression Estimates of Odds Ratios for Reporting “Ever Forced to have Intercourse” among Men and Women Aged 25–29, NSFG 2011–2013

From Multivariate Logistic Regressions: Odds Ratios (Chi-Square)

	Women	Men
Education[§]		
No College	2.60 (3.52)	4.05 (1.63)
1–3 Years of College	2.69 * (5.27)	4.26 (2.59)
Race/Ethnicity[†]		
Hispanic	0.80 (1.60)	2.33 (0.06)
Non-Hispanic Black	0.62 * (5.50)	4.76 * (4.12)
Other or Mixed	2.87 ** (9.33)	3.77 (1.20)
Mother’s Education[‡]		
No college	0.45 * (4.43)	0.57 (0.02)
1–3 Years of College	0.64 (0.05)	0.29 (2.58)
Mother’s Work (full or part-time)	1.13 (0.24)	0.72 (0.50)
Two Parents From Birth	0.43 *** (14.92)	1.58 (1.41)
Mom 19 Years or Younger at First Birth	1.71 * (6.50)	1.13 (0.09)
Raised with Religion	2.76 * (4.55)	0.41 (2.30)
N	1,033	831

*
p < .05

**
p < .01

p < .001 (Two-tailed tests)

[§]Four or more years of college is the reference category.

[†]Non-Hispanic whites are the reference category.

[‡]The mother having a bachelor’s degree or more is the reference category.