

Young Women's Desire for Sex and the Risk of Early Pregnancy

Abigail Weitzman

Population Studies Center, University of Michigan

Population Research Center & Department of Sociology, University of Texas

Please direct all correspondence to:

Abigail Weitzman

426 Thompson St.

Ann Arbor, MI 48104

aweitzma@umich.edu

Young Women's Desire for Sex and the Risk of Early Pregnancy

Abstract

Despite its likely influence on the proximate determinants of fertility, women's desire for sex remains largely absent from theoretical and empirical models of pregnancy risk. This study describes young women's desire for sex during the transition to adulthood and investigates the relationship between desiring sex and the hazard of early pregnancy using new longitudinal data from the Relationship Dynamics and Social Life Study, a population-representative sample of 951 young adult women updated weekly for a period of 2.5 years. Findings indicate that the intensity with which young women want to have sex varies both across and within women, often increasing over time. How much a young woman desires sex is not only related to her sexual activity, but also to her contraception use and corresponding risk of becoming pregnant. The effects of desiring sex on contraception use and pregnancy, but not the effect on sexual activity, can be explained in part by the desire to avoid pregnancy and the willingness to have sex without contraception. These findings provide new insights into why young women's sexual and contraceptive behaviors do not always align with their short-term fertility goals and illustrate the salience of women's desire for sex for demographic models of fertility.

Despite its likely salience to the proximate determinants of fertility, the desire for sex rarely features in demographic models of sexual behavior, contraceptive use, or pregnancy. Over time, through the consistent inclusion of certain variables and exclusion of others, demographers develop and reinforce shared expectations about what is important and what is not (Watkins 1993). These assumptions, although implicit, have substantial implications for the development of theoretical frameworks used to understand and describe human behavior as it relates to population reproduction and growth (Watkins 1993). That the desire for sex is consistently absent from demographic models of reproductive processes suggests that it is often assumed to be extraneous. For this to be true either all individuals must share similar sexual desires, the desire for sex must affect all individuals the same, or the desire for sex must have a negligible effect on reproductive behavior. This article advances existing demographic scholarship on early fertility, and models of reproductive decision-making more broadly, by explicitly examining (1) variation in young women's desire for sexual intercourse and (2) the relationship between women's desire for sex and the risk of pregnancy during the transition to adulthood, a period of the life course marked by a high concentration of new sexual and romantic experiences and changing attitudes and intentions.

Several dominant paradigms used to explain reproductive behavior, such as rational choice theory (Friedman and Hechter 1988), the theory of reasoned action (Fishbein and Ajzen 2011), and the cognitive-social model of fertility (Bachrach and Morgan 2013), suggest that the preferences and intentions individuals possess are consequential to the subsequent actions they take. This idea has been abundantly tested with regard to contraceptive use and pregnancy (Godin and Kok 1996; Jemmott 3rd, Jemmott and Hacker 1991; Reinecke, Schmidt and Ajzen 1996; Sutton, McVey and Glanz 1999), but has only rarely been considered with regard to sexual activity (Cha et al. 2007). If these theories hold, then women's desire for sex should result in an increased likelihood of engaging in intercourse. Moreover, as several scholars have recently conjectured (but not tested), women's desire for sex may compete with or override their concerns about unwanted pregnancy (Bachrach and Morgan 2013; Barber 2011; Barber, Yarger and Gatny 2015; Klobas 2011). If so, then women's desire for sex may not only increase their likelihood of sexual intercourse, but more specifically, their likelihood of intercourse without contraception. Acknowledging and accounting for women's desire for sex may therefore help to explain why women engage in behaviors that increase the risk of pregnancy even when they do not wish to become pregnant.

In light of the potential explanatory power of women's desire for sex, and in response to a paucity of research exploring such a possibility, this study investigates whether and how much the desire for sex varies across young adult women and changes over time; the extent to which the desire for sex is related to both women's sexual behavior and contraceptive use; and whether the effects of desiring sex on fertility-related behaviors persist net of desires to avoid pregnancy, attitudes toward contraception, and the willingness to have sex without contraception. To conduct these analyses, I leverage rich, time-varying data on women's desire for sex, sexual activity, contraceptive use, and pregnancy from 951 18-19 year-old women collected over the course of two and a half years during the Relationship Dynamics and Social Life study. I model the relationship between women's sexual desire and weekly sexual activity and contraceptive use with logistic regressions with fixed effects and the relationship between women's sexual desire and pregnancy conception using hazard regressions with random effects. These models generate estimates of a young woman's likelihood of having sex, using contraception, and becoming pregnant in a given week based on her desire for sex measured within the three months prior. The results

provide new information on the salience of desiring sex for young women's reproductive behaviors and suggest that to better understand the antecedents to early fertility, and the complex relationships between them, demographers should explicitly take into account how much (or how little) young women want to have sex.

Does the Desire for Sex Differ Across Women or Change Over Time?

In its broadest sense, the desire for sex possesses three dimensions: individual and/or relationship-derived psychological motivation; sociocultural values associated with sexual expression; and the biological (hormonal) drive to be sexually active (Levine 2003). With this broad definition in mind, there are a variety of reasons why women might desire sex. The most obvious is that sex can be a pleasurable physical occurrence that women want to experience more of (Armstrong, England and Fogarty 2012). Additionally, the emotional satisfaction that some women derive from intercourse, including a sense of intimacy and romance (Regan and Berscheid 1995, 1996; Schachner and Shaver 2004), feeling wanted and desired (Meston and Buss 2007), or feeling in control of one's sexual subjectivity (Martin 1996; Tolman 2009) may all increase women's sexual desire. During the transition to adulthood, the desire for sex may also stem from an increasing normalization of sexual activity (Bearak 2014; Udry and Billy 1987). As young adults grow older, greater shares of their peers become sexually active (Udry and Billy 1987). During this time, desiring sex may reflect a broader desire to fit in or to increase status or popularity (Prinstein, Meade and Cohen 2003; Schachner and Shaver 2004). It may also reflect the motivation to please one's partner (Klusmann 2002). Although less common among young adults, some women may also want to have sex because they want to become pregnant (Levine 2003).

There are also several reasons why women may *not* want to have sex. For instance, personal values such as the opposition to nonmarital intercourse may depress the desire for sex among young adults (Paradise et al. 2001). Likewise, religiosity or membership to a peer group that disapproves of sex may contribute to low desires for sex (Barber, Yarger and Gatny 2015; Thornton and Camburn 1989). Among particularly risk-averse women, the desire to avoid pregnancy may also deflate sexual desire (Blinn-Pike 1999).

If all women desired sex equally, and if women's desire for sex did not fluctuate over the life course, then this uniformity would negate the predictive power of desiring sex. Besides the heterogeneous reasons why women may (or may not) desire sex, and the fact that such heterogeneity should lead to differing degrees of desire, existing social psychological research refutes this possibility. First, clinical studies indicate that women's sexual desire can range from hypo-sexual (extremely low desire) to hyper-sexual (extremely high desire), though most women fall somewhere in between (Bitzer, Giraldi and Pfaus 2013; Kaplan 1995; Winters 2010; Winters, Christoff and Gorzalka 2010). Meanwhile, qualitative studies suggest that how much young women desire sex is highly contextual (Martin 1996; Tolman 2009).

Second, longitudinal research indicates that women's desire for sex and sexual satisfaction both change over the life course, with women's desire increasing during young adulthood and decreasing during mid to later life (Avis et al. 2009; Christopher and Sprecher 2000; Hällström and Samuelsson 1990). There are also a number of reasons to believe that women's desire for sex might change during the transition to adulthood specifically. These include an increased pressure to have sex (Aarons and Jenkins 2002; Bearak 2014; Sieving et al. 2006), which may lead some women to want sex as part of a broader wish to fit in or to please others; new sexual experiences that introduce new forms of pleasure (Horne and

Zimmer-Gembeck 2005; Impett and Tolman 2006); and cognitive dissonance reduction after sexual debut and/or as women begin having sex with greater regularity (Lindgren et al. 2011).

In sum, young women may desire sex for a plethora of reasons, though some women should desire sex more than others, and the depth of women's desire may change as they enter adulthood. If heterogeneity in how much women desire sex translates into heterogeneity in sexual behavior and contraceptive use, then it should also affect women's risk of pregnancy.

Integrating the Desire for Sex into Models of Fertility

The desire for sex can only be related to young women's risk of pregnancy if it leads to a greater frequency of heterosexual intercourse and/or less consistent use of contraception (Bongaarts 1978). How might the desire for sex affect these two behaviors? The theory of reasoned action (Fishbein and Ajzen 2011) suggests that desiring sex should lead women to deliberately pursue and engage in intercourse. Relatedly, the cognitive-social model of fertility (Bachrach and Morgan 2013) and the prototype/willingness model (Gerrard 2013) suggest that in addition to the deliberate pursuit of one's desires, individuals' automatic reactions also affect their behavior. Moreover, deliberate intentions and automatic responses may further reinforce one another over time (Bachrach and Morgan 2013) and in this way can simultaneously contribute to a willingness to engage in a specific behavior, including sexual intercourse.

The relationship between desiring sex and sexual activity is not entirely straightforward, however: while many women have sex because it brings them pleasure or they otherwise want to (Higgins and Hirsch 2008), sex is not always consensual (Christopher and Sprecher 2000), and even when it is consensual women don't necessarily desire sex but may instead comply to unwanted sex in an effort to maintain their relationships or adhere to gender norms (Impett and Peplau 2003). At the same time, women can strongly desire sex but be thwarted by personal or environmental circumstances. For instance, residing with roommates or parents may inhibit adolescents' opportunities for intercourse (Schalet 2011). Sexual desire should therefore not be a perfect predictor of sexual activity even though it should increase its likelihood among many women.

Although less obvious, the desire for sex may also influence women's willingness to have sex without contraception, and thus their contraceptive use (Figure 1). This may be because when people desire sex they are more easily aroused (Moholy et al. 2015), and once aroused individuals tend to become more sexually impulsive and willing to have sex without contraception (Ariely and Loewenstein 2006; Norris et al. 2009; Winters, Christoff and Gorzalka 2010). Additionally, women may view contraception as a hassle or a burden for a number of reasons, including monetary costs, the planning and effort it requires, or stigma (Dennis and Grossman 2012; Kuiper et al. 1997). When women simultaneously view contraception as a hassle and desire sex, they may be willing to have sex without contraception. Relatedly, among women who view sex as a source of pleasure and contraception as a pleasure impediment, desiring sex may increase sexual activity without contraception despite the increased risk of STI contraction or unwanted pregnancy (Fennell 2014; Foster et al. 2012; Higgins and Hirsch 2008; Jadack et al. 1997). Finally, women may sometimes strongly desire sex but not be in a situation that is conducive to regular sexual activity. The scarce opportunities for sex may lead these women not to regularly use or carry contraception (Kisker 1985; Loewenstein and Furstenberg 1991), while their strong desire

for sex may lead them to prioritize sex over contraception when unexpected sexual opportunities arise. Each of these explanations posits that the strength of desires for sex should affect at least some women's willingness to have sex without contraception, as depicted in Figure 1.

From a theoretical perspective, examining women's desire for sex is not only relevant because it may influence the proximate determinants of fertility, but also because it may conflict with the desire to avoid pregnancy. Imagine a woman who possesses both a strong desire to have sex and a strong desire not to become pregnant. If she is presented with an opportunity to have sex but she does not have any contraception, she must either choose to forego sex or to have sex without the contraception needed to prevent pregnancy. This issue is made more complicated by the fact that the desire for sex can be sated, at least temporarily, while the desire to avoid pregnancy requires consistent effort over an extended period of time. In other words, in order to avoid pregnancy, a woman who wants to have sex may have to repeatedly pass up opportunities to have sex without contraception, which may prove difficult over time. This dilemma is exemplified by research on adolescents, who frequently report not expecting sexual opportunities to arise and then choosing to have sex without contraception despite the risks this decision poses (Kisker 1985; Loewenstein and Furstenberg 1991). Taking into consideration women's desire for sex is thus essential to comprehensively answering longstanding questions about why young individuals do not always act in accord with their predominantly negative fertility intentions.

Data and Methods

Data

Sample. I use data from the Relationship Dynamics and Social Life (RDSL) study, which followed a population-representative sample of 1,003 18 and 19 year old women for 2.5 years. Respondents resided in one racially and socioeconomically diverse Michigan county at the time of baseline and were randomly selected from the Department of State's driver's license and Personal Identification Card database.

The study began with a comprehensive baseline survey. After completing the survey, respondents were invited to participate in the journal portion of the study, which consisted of 5-minute weekly surveys online or by phone for the following 30 months. Nine hundred and ninety-two respondents (99%) agreed to complete these weekly journals, thus facilitating frequent observation of their sexual and reproductive outcomes over an extended period of time. Because this study is primarily concerned with the relationship between young women's sexual desires and their risk of pregnancy, I focus the analysis on respondents who completed two or more journals and on weeks in which respondents were not pregnant or were only in their first week of pregnancy. This yields a final sample of 54,884 weeks across 951 respondents.

Desire to Have Sex. During the baseline survey respondents were asked, "How much do you want have sexual intercourse in the next year?" Possible answers ranged from (0) "not at all" to (5) "extremely." This question was asked again every three months during the journal portion of the study.

Desire to Avoid Pregnancy. At baseline and then again each week, respondents were asked "How much do you want to avoid getting pregnant in the next month?" with possible

answers ranging from (0) “don’t want at all to avoid” to (5) “really want to avoid.” In most weeks, respondents strongly wanted to avoid sex, with a mean weekly score of 4.78.¹

Contraceptive Opposition. Oppositional attitudes toward contraception were measured with eight questions asked at baseline and then again every three months. Specifically, respondents were asked to express how much they agreed or disagreed, on a scale of 1 to 4, with the following statements: “If a woman asks her partner to use a condom, he will think that she doesn’t trust him.” “Birth control is morally wrong.” “In general, birth control is too much of a hassle to use.” “Using birth control is likely to make a woman feel sick.” “Using birth control interferes with sexual enjoyment.” “If a girl uses birth control, she is looking for sex.” “In general, birth control is too expensive to buy.” “It takes too much planning ahead of time to have birth control on hand when you’re going to have sex.” I dichotomize responses to each question such that (1) indicates agreement and (0) disagreement. I then sum these dichotomized responses to form the *Contraceptive Opposition Scale*, which ranges from 0 to 8, with higher values indicating more opposition to contraception. In most weeks, respondents were generally approving of contraception, with an average score of 0.83 on the scale (Table 1).

Willingness to Forego Contraception. At baseline and then again every three months, respondents were asked “Imagining being with a partner who wants to have sexual intercourse, and you want to have sex, but you have no birth control available. How willing would you be to have sex without any birth control?” Possible answers ranged from (0) “not at all” to (5) “extremely.” Respondents’ willingness to have sex without contraception was generally low during survey, with an average score of 1.54 (Table 1).

Sexual and Contraceptive Outcomes. Each week, respondents were asked a series of questions to determine if they had had any kind of partner with whom they’d had “physical or emotional contact.” If so, they were asked “...did you have sexual intercourse with [partner]? By sexual intercourse, we mean when a man puts his penis into a woman’s vagina.” And “...did you have sexual intercourse with anyone other than [partner]?” Based on responses to these two questions, I create a dichotomous indicator of whether respondents were (1) *sexually active* in a given week or (0) not. Weeks when respondents did not report having a partner are coded as (0) not sexually active. Respondents were sexually active in one-third of weeks in the study (Table 1).

Every week respondents were also asked “Did you use or do anything that can help people avoid becoming pregnant, even if you did not use it to keep from getting pregnant yourself?” When a respondent answered “yes” she was asked a series of follow-up questions about particular non-coital methods, including oral contraceptive pills, patch, Nuva-Ring, Depo-Provera, implant, IUD, and rhythm. When a respondent also reported sexual intercourse in that journal she was asked a second set of questions about her use of coital-specific contraceptive methods, including condoms (male and female), diaphragm/cervical cap, spermicide, and withdrawal. I define *any contraceptive use* as (1) if a respondent indicated anywhere in the journal that she used at least one of the above methods and (0) otherwise.

Respondents who reported using any type of coital contraception were also asked whether they used “some method of birth control every time” they had intercourse. Based on answers to this question and the questions about non-coital contraception I create a measure of *used contraception every time* a respondent was sexually active in a given week. This

¹ Including a dichotomous version of this variable, in which (1) equates the strongest desire to avoid pregnancy and (0) < the strongest desire, yields substantively similar conclusions to those of the preferred models presented below.

measure is defined as (1) when respondents reported using coital contraception every time, or reported using non-coital contraception and (0) if they were using coital contraception but did not use it every time or were not using any form of contraception.

Pregnancy. Each week respondents were asked, “Do you think there might be a chance that you are pregnant right now?” When a respondent answered “yes” she was asked “Has a pregnancy test indicated that you are pregnant?” When a respondent again reported “yes” she was coded as (1) for pregnant and (0) for not. Her two journals prior were retroactively coded as (1) pregnant because the earliest a pregnancy test can detect pregnancy is two weeks after conception. Thus, although imperfect, this measure of pregnancy begins at the time of presumed conception. In this analysis, I right-censor pregnancy such that weeks in which the respondent is pregnant after the presumed week of conception are not included.² Of the 951 respondents in this analysis, 196 reported a total of 232 pregnancies during the study.

Time-Varying Demographic Characteristics. I control for four time-varying socio-demographic characteristics. The first is respondents’ education, which is updated every three months and defined as (1) <H.S. (dropped out or still enrolled), (2) graduated H.S. but not enrolled in post-secondary and (3) enrolled in or graduated from post-secondary (2-year or 4-year). Second is whether a respondent is currently employed (yes or no). Employment status is also updated every three months. Third is the duration of respondents’ current relationship, measured in days, where (0) indicates not in a relationship.³ Finally, I control for respondents’ age, ranging from 18 to 22 years.

Time to pregnancy and time in study. To account for respondents’ increasing hazard of pregnancy over time, models of pregnancy conception adjust for *time to pregnancy* and its squared term. *Time to pregnancy* is defined as the number of months from respondents’ start of the study or the end of their last pregnancy (during the study) until they become pregnant or their participation in the study ends. *Time in study* adjusts for the total number of weekly journals respondents completed during the study.

[Table 1]

Analytic Strategy

This study’s primary objective is to better understand the relationship between young women’s desire for sex and their risk of early pregnancy. To begin, I estimate the relationship between how much a respondent *desires to have sex* and the proximate determinants of fertility—sex and contraception⁴—using logistic regressions with person-fixed effects. Fixed effects models allow for within-respondent comparisons and inherently control for time-invariant differences between respondents, including unobserved differences (Gelman and Hill 2007) such as earlier sexual experiences. As a sensitivity test, I rerun these models using random effects both with and without controlling for time-invariant demographic characteristics (race, childhood socioeconomic disadvantage, and age at first-intercourse).⁵ The results, presented in Appendix A, demonstrate a pattern of effects consistent with those of the primary analyses.

² Weeks after the pregnancy ended are included, however.

³ Relationship duration at baseline is calculated from the number of months respondents reported being in that relationship prior to baseline survey.

⁴ *Used any contraception* and *used contraception every time* are estimated only among weeks in which respondents are sexually active.

⁵ Childhood socioeconomic disadvantage is a scale ranging from 0 to 4 and combines information on whether respondents received public assistance as a child, grew up in a two-parent home, had a mother who was less

If *desiring to have sex* affects respondents' sexual activity and contraceptive use, then it should also affect their risk of pregnancy. To test this explicitly, I estimate the relationship between the desire for sex and the odds of becoming pregnant in a given week using hazard models with random effects. When using random effects, point estimates reflect a combination of differences within respondents across weeks, and between-respondent differences in whether or how often women were in the various states of the specific variable. As a sensitivity test, I rerun these hazard models using person-fixed effects (and therefore restricting the sample to women who ever experienced pregnancy during the study period). The results lead to substantively similar conclusions in terms of magnitude and significance (available upon request).

A second and related objective of this study is to test whether the effects of wanting to have sex persists net of the desire to avoid pregnancy and attitudes toward contraception, and whether the effects of wanting to have sex are mediated by the willingness to have sex without contraception. I therefore model each outcome with a series of nested regressions. In the first model, I only include *desire to have sex* and the time-varying demographic controls as predictors. The second model adds *desire to avoid pregnancy* and the *contraceptive opposition scale*, while the third further adds *willingness to have sex without contraception*. The analysis of pregnancy risk includes a fourth model that also adjusts for sexual activity and whether a respondent used contraception every time she had sex in a given week.

The results of all models are reported as log-odds. Standard errors are presented in parentheses below. Because *desire to have sex* is assessed every three months, whereas sexual activity, contraceptive use, and pregnancy are assessed weekly, the predictor—*desire to have sex*—is lagged (and thus precedes the outcome) in all weeks except weeks in which it is reassessed. In these weeks, the predictor and the outcomes are contemporaneous.

Results

Descriptive Results

The predictive value of the desire for sex hinges in part on there being enough variation across and/or within women to detect patterns of relationships between desiring sex and reproductive behavior and pregnancy. To examine variation in the desire for sex *across* women, I conduct a univariate analysis of how much, at baseline, respondents reported wanting to have sex in the upcoming year (Figure 2). This exercise reveals substantial heterogeneity in the strength of women's desire for sex at the start of the study. As can be seen in Figure 2, approximately one-fifth of respondents (22%) reported that they did not want to have sex at all. In contrast, another fifth reported a strong or extreme desire for sex in the next year (a score of 4 or 5, 19%). The remainder of respondents reported desire levels somewhere in between.

[Figure 2]

To observe whether and how the desire for sex changes *within* women over time, I use Kernel-weighted local polynomial smoothing to plot respondents' desire for sex during the course of the study. These plots, presented in Figure 3, are divided by respondents' reported desire for sex at baseline. On average, young women's desire for sex increases during the study, with the exception of women whose desire for sex was already at the

than 20 years at first-birth, and had a mother who did not attend college. Higher scores depict greater disadvantage.

highest level. Moreover, increases in sexual desire appear steepest among women whose desire for sex was the lowest at baseline (0-2). It is therefore not the case that women's desire for sex remains constant during the transition to adulthood.

[Figure 3]

The desire for sex can only be relevant to pregnancy if it affects women's sexual and/or contraceptive behaviors, but it would not be valuable to empirical models of pregnancy risk if it predicted either perfectly. Figure 4 considers how the frequency of sexual activity (measured over three month periods) corresponds to women's most recent report of their desire for sex. Although there is a linear increase in the percentages of women reporting stronger desires for sex at higher frequencies of sexual activity, many women who report a strong desire for sex are only sexually active every other week or less. Moreover, during the average three-month period when women are not sexually active, only one-third of women (35%) report not wanting to have sex at all and 16% report strongly or extremely wanting to have sex (a score of 4 or 5). These women who desire sex but are rarely or never sexually active may be more willing to have sex without contraception if their dearth in sexual activity corresponds to an unobservable lack of sexual opportunities.

[Figure 4]

Multivariate Results from Models Estimating the Proximate Determinants of Fertility

To estimate the relationship between the desire for sex and the proximate determinants of fertility, Table 2 presents the results of nested logistic regressions with person fixed-effects estimating respondents' sexual activity, use of any contraception, and use of contraception at every intercourse during the weeks measured simultaneously or after the desire for sex. Overall, the results confirm the anticipated pattern: women's desire for sex has both a positive influence on their sexual activity and a negative influence on their contraceptive use.

Specifically, a one-unit increase in the *desire to have sex* is associated with 29% higher log-odds of sexual activity (Model I). As expected, this effect is in the opposite direction from the effect of the *desire to avoid pregnancy*, which is associated with a 22% decrease in the log-odds of being sexually active in a given week (Model II). In other words, the *desire to have sex* and the *desire to avoid pregnancy* exert competing influences on women's sexual activity. Nevertheless, the relationship between the *desire to have sex* and *sexually active* maintains its significance and magnitude even after adjusting for the desire to avoid pregnancy and opposition to contraception (Model II). It is also not mediated respondents' willingness to have sex without contraception, which shares no significant relationship with sexual activity (Models III).

Moving to the analysis of contraception in weeks when women were sexually active, a one-unit increase in the *desire to have sex* is associated with a 15% decrease in the log-odds of *using any contraception* (Model IV). Again this effect is in the opposite direction of the effect of the *desire to avoid pregnancy*, which increases the odds of *using any contraception* by a much larger 57% (Model V). However, the effect of *desire to have sex* is in the same direction as the effect of *contraceptive opposition*, which decreases the odds of any contraception use by 15% with each one-unit increase (Model V). When controlling for both the *desire to avoid pregnancy* and *contraceptive opposition*, the effect of the *desire to have sex* is reduced from 15% to 11% (Model V). Once controlling for respondents' *willingness to have sex without contraception*, which decrease the log-odds of *using any contraception* by 13%, the effect of the *desire to have sex* becomes null (Model VI).

Models assessing respondents' *use of contraception every time* they are sexually active in a given week reveal a similar pattern: a one-unit increase in the *desire to have sex* decreases the

log-odds that respondents used contraception every time by 7% but is reduced slightly when adjusting for respondents' desire to avoid pregnancy and opposition to contraception (Model VIII), and is mediated entirely by adjusting for respondents' willingness to have sex without contraception (Model IX). Thus, although the relationship between the *desire to have sex* and contraceptive use can be partially explained by differences in respondents' fertility intentions and opposition to contraception, it operates in large part through their willingness to forego contraception during intercourse.

Multivariate Results from Models Estimating Pregnancy Conception

Having shown that the desire for sex affects both women's sexual and contraceptive behaviors, this analysis next turns to pregnancy. Table 3 presents the results of hazard regression models with random effects estimating the effect of how much women desire sex on their odds of becoming pregnant in the contemporaneous or subsequent weeks. The results echo those observed in Table 2. In particular, a one-unit increase in the desire for sex increases respondents' log-odds of becoming pregnant by 15% (Model X). This positive effect is in contrast to the negative effect of the *desire to avoid pregnancy*, which much more substantially decreases the log-odds (by 42%) with every one-unit increase (Model XI). Nevertheless, the effect of the *desire to have sex* remains significant once respondents' *desire to avoid pregnancy* and *contraceptive opposition* are controlled for, though its effect size is reduced to 12% (Model XI). The *willingness to have sex without contraception*, which increases the log-odds of pregnancy by 11% with every one-unit increase, again entirely mediates the effect of respondents' desire for sex once it is included in the model (Model XII). No mediation effect of sexual activity or contraception use can be observed because the point estimate for the *desire to have sex* is already null, but sexual activity demonstrates an independent, positive effect on the log-odds of pregnancy, while contraceptive use demonstrates an independent, negative effect (Model XIII).

Discussion

This study addressed the longstanding absence of women's sexual desire from demographic models of individual-level fertility. In so doing, it expanded our knowledge of the determinants of fertility to include the desire for sex—not just the desire for (or to avoid) pregnancy—and highlighted the complex relationship between desiring sex and other, better known antecedents to fertility.

The analyses presented in this study made four unique contributions to demographic scholarship. First, they demonstrated that the strength with which women desire sex varies across young adults and changes over time. These changes generally portray a pattern of increased sexual desire as women transition to adulthood. Second, the results indicated that women's desire for sex not only affects their sexual activity, but also their contraceptive use. Previous scholarship suggests that this effect on contraceptive use may be because women who more strongly desire sex are also more likely to be sexually impulsive (Ariely and Loewenstein 2006; Norris et al. 2009; Winters, Christoff and Gorzalka 2010). It may also be that when women's desires and opportunities for sex are mismatched such that women strongly desiring sex have little opportunity for intercourse they prioritize sex over contraception during rare sexual encounters. The third contribution of this study was to show that the effects of women's desire for sex on contraception use operate in large part through the willingness to have sex without contraception. Finally, by showing that the

desire for sex and the desire to avoid pregnancy exhibit contrasting influences on women's reproductive behaviors, and that the desire to avoid pregnancy does not fully mediate the desire for sex on reproductive activities, this study confirmed that the desire for sex often conflicts with the desire to avoid pregnancy. Taken together, these findings signal women's sexual desire as a new area of research with the potential to significantly refine theoretical models of fertility and reproductive behavior.

The analyses presented here reflect the situation of young women during the transition to adulthood—a stage of the life course notable for its density of changes (new jobs, living arrangements, friends, relationships, etc.) and decisions with substantial future consequences, such as decisions about relationships, career, contraception, and family formation. Further research is needed to test the generalizability of these findings for women at later stages of the life course, when relationships and social trajectories are comparatively more stable.

Nevertheless, this research has several meaningful implications for research on fertility. In particular, it suggests that cognitive models of fertility decision-making would be improved by taking into account individuals' competing desires. By acknowledging that women may want to have sex even when they do not want to become pregnant, demographers can better explain instances in which women's reproductive behaviors do not align with their stated fertility intentions. Further, this study's findings raise new questions about which specific dimensions of sexual desire (psychological, sociocultural, or biological) affect sexual behavior and contraceptive use; whether these different dimensions bear similar or disparate influences on reproductive behaviors; and under what circumstances the desire for sex is of more or less consequence to women's risk of pregnancy.

Beyond its theoretical and empirical contributions, this study presents significant implications for policies and programs aimed at reducing early pregnancy. In particular, the findings confirm that abstinence only programs often fail at preventing pregnancy because the effects of desiring sex on sexual behavior and contraceptive use persist net of the effects of desiring to avoid pregnancy. Considering that the desire for sex is explained in large part by the willingness to forego contraception, one way to improve contraceptive use among young women may be for advertisers and public health campaigns to appeal to the desire for sex (e.g. making contraception appear sexy, debunking myths about contraception and sexual pleasure, highlighting that long-acting reversible forms of contraception can facilitate a greater degree of sexual impulsivity with little risk of pregnancy). Finally, given that the desire for sex is associated with a higher risk of intercourse without contraception, and with early pregnancy, one way for clinicians to gauge young patients' risk profile may be to ask about how much they want to have sex.

This study foregrounds the value of acknowledging women's sexual desires and the potential influence that these desires have on their reproductive behaviors, including both sexual intercourse *and* contraception use. While leaving open questions about the influence of different dimensions of sexual desire, this study shows that research on early pregnancy must not overlook the importance of young women's sexual desires and calls for new theoretical models that explicitly account for these desires.

Figure 1: Conceptual Diagram of the Relationships between the Desire for Sex, the Desire to Avoid Pregnancy, Attitudes toward Contraception, and Pregnancy

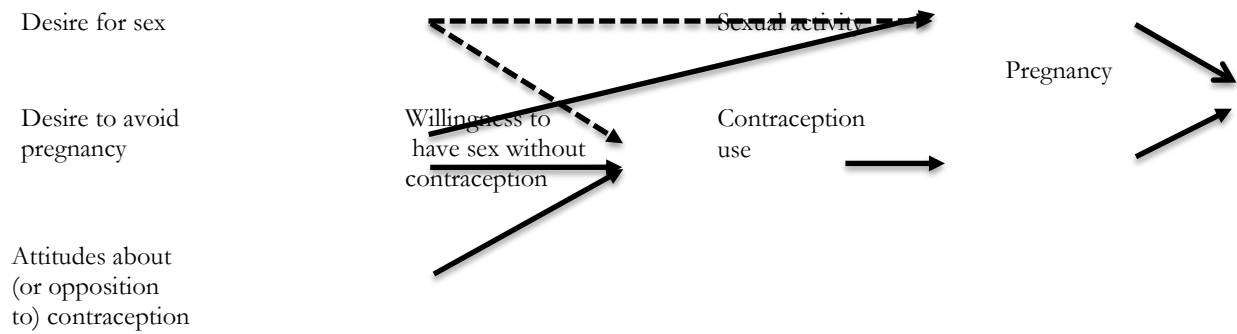


Figure 2: Univariate Distribution of the Desire to Have Sex in the Next Year as of Baseline, N=951 respondents

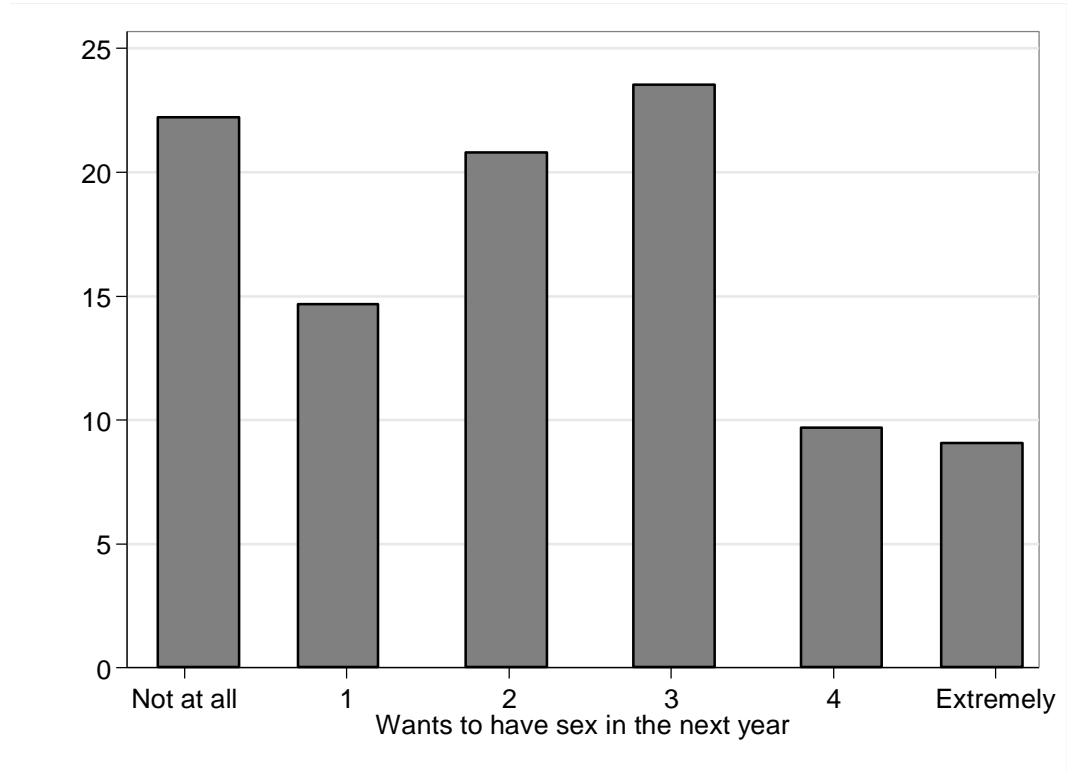


Figure 3. Smoothed Lowess Plots of the Desire to Have Sex over the Course of the Study, Plotted by Level of Wanting to Have Sex at Baseline, N=54,884 weeks across 951 respondents

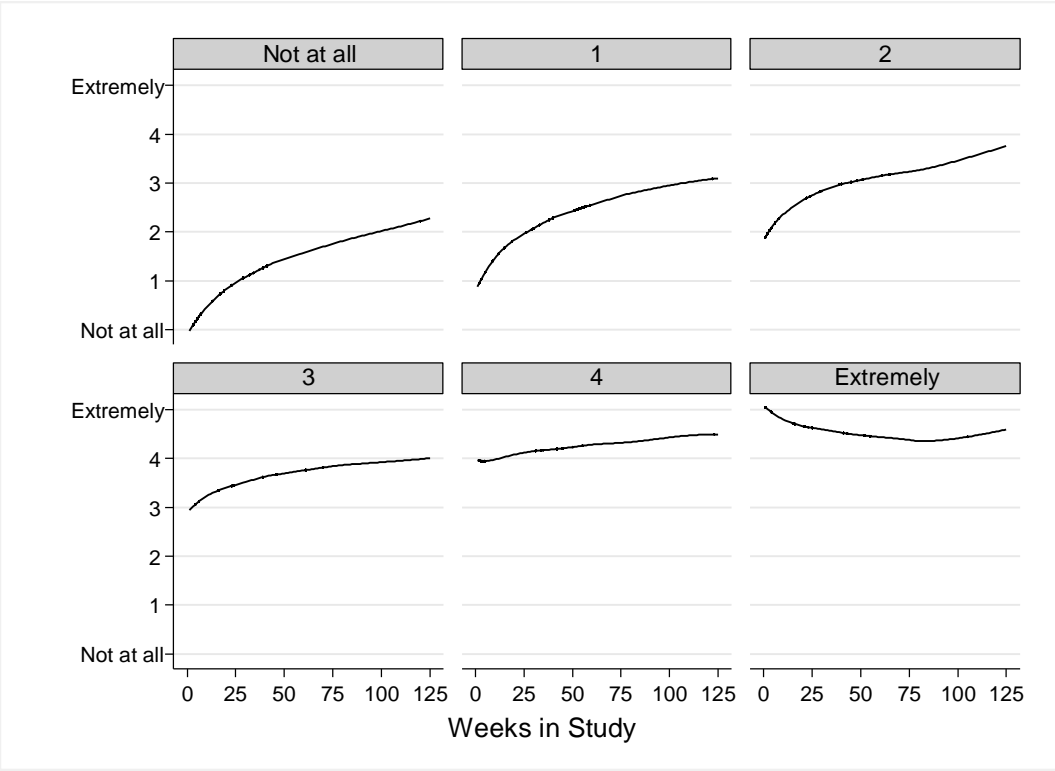
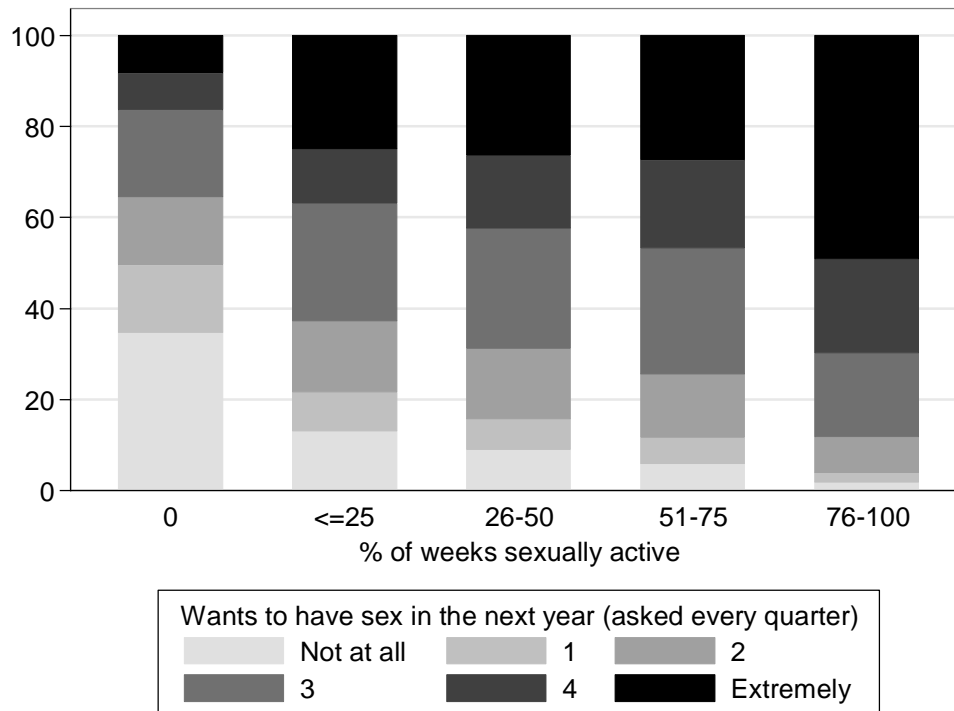


Figure 4. Desire to Have Sex by Sexual Activity in the Subsequent Quarter
N=54,884 weeks across 951 respondents



Note: The question “How much do you want to have sex in the next year?” is asked every three months. Quarters refer to the three-month periods between when the question was asked. In the figure above, the *% of weeks sexually active* refers to the percent of weeks that respondents had sex since the last time the question was asked.

Table 1. Descriptive Statistics (N= 54,884 weeks across 951 respondents)

	Mean/ proportion	SD
Desires and attitudes		
Desire to have sex in the next year (0-5)	2.77	1.80
Desire to avoid pregnancy (0-5)	4.78	0.86
Contraceptive opposition scale (0-8)	0.83	1.27
Willing to have sex without contraception (0-5)	1.55	1.57
Reproductive outcomes		
Sexually active	0.33	
Used any contraception ^a	0.87	
Used contraception every time ^a	0.70	
Became pregnant	0.004	
Time-varying demographic controls		
Education		
<H.S.	0.07	
Graduated H.S., not enrolled in post-secondary	0.20	
Enrolled in or graduated post-secondary	0.73	
Employed	0.56	
Relationship duration (days)	573.84	581.59
Age	20.29	0.94

^a Contraceptive variables are estimated for sexually active weeks only. Standard deviations reported for interval-level variables only.

Table 2: Results from Logistic Regressions with Fixed Effects Estimating Sexual Activity and Contraception Use

	Sexually active			Used any contraception			Used contraception every time		
	I	II	III	IV	V	VI	VII	VIII	IX
Desires and attitudes									
Desire to have sex	0.29*** (0.01)	0.29*** (0.01)	0.30*** (0.01)	-0.15*** (0.04)	-0.11** (0.04)	-0.06 (0.04)	-0.07* (0.03)	-0.06* (0.03)	-0.01 (0.03)
Desire to avoid pregnancy		-0.22*** (0.02)	-0.22*** (0.02)		0.57*** (0.03)	0.57*** (0.03)		0.45*** (0.03)	0.44*** (0.03)
Contraceptive opposition scale		0.01 (0.02)	0.01 (0.02)		-0.14*** (0.04)	-0.14*** (0.04)		-0.12*** (0.03)	-0.10** (0.03)
Willing to have sex without contraception			-0.02 (0.01)			-0.13*** (0.03)			-0.15*** (0.02)
Time-varying demographic controls									
Education (ref: <H.S.)									
Graduated H.S., not enrolled	0.08 (0.08)	0.11 (0.08)	0.11 (0.08)	-0.18 (0.15)	-0.49** (0.15)	-0.48** (0.15)	-0.07 (0.13)	-0.27* (0.13)	-0.25† (0.13)
Enrolled in or graduated post-secondary	-0.06 (0.08)	-0.02 (0.08)	-0.01 (0.08)	-0.01 (0.17)	-0.45* (0.18)	-0.44* (0.18)	0.13 (0.14)	-0.09 (0.14)	-0.07 (0.14)
Employed	0.07† (0.04)	0.06 (0.04)	0.06 (0.04)	-0.04 (0.10)	0.11 (0.10)	0.15 (0.10)	-0.07 (0.07)	0.01 (0.07)	0.03 (0.07)
Relationship duration	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Relationship duration squared	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Age	-0.13*** (0.02)	-0.13*** (0.02)	-0.13*** (0.02)	-0.36*** (0.06)	-0.32*** (0.07)	-0.31*** (0.07)	-0.24*** (0.04)	-0.23*** (0.04)	-0.20*** (0.05)
Observations (weeks)	40,977	40,977	40,977	8,359	8,359	8,359	12,257	12,257	12,257
Respondents	702	702	702	260	260	260	417	417	417

Note: For all models, the number of observations is less than 951 because logistic regressions with fixed effects can only be estimated among women who demonstrate any variation in the outcome during the study. *Used any contraception* and *used contraception every time* are estimated only among sexually active weeks.

Standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

Table 3. Results from Nested Discrete Time Hazard Regressions with Random Effects Estimating Conception in a Given Week

	X	XI	XII	XIII
Desires and attitudes				
Desire to have sex	0.15** (0.05)	0.12* (0.05)	0.08 (0.05)	0.01 (0.05)
Desire to avoid pregnancy		-0.42*** (0.04)	-0.41*** (0.04)	-0.29*** (0.04)
Contraceptive opposition scale		0.03 (0.05)	0.02 (0.05)	-0.00 (0.05)
Willing to have sex without contraception			0.11* (0.05)	0.05 (0.05)
Reproductive behaviors				
Sexually active				1.78*** (0.19)
Used contraception every time				-1.62*** (0.21)
Time-varying demographic controls				
Education (ref: <H.S.)				
Graduated H.S., not enrolled	0.23 (0.25)	0.28 (0.25)	0.29 (0.25)	0.23 (0.24)
Enrolled in or graduated post-secondary	-0.40 (0.25)	-0.20 (0.25)	-0.17 (0.25)	-0.08 (0.24)
Employed	-0.28† (0.15)	-0.24 (0.15)	-0.23 (0.15)	-0.17 (0.15)
Relationship duration	0.00* (0.00)	0.00† (0.00)	0.00† (0.00)	-0.00 (0.00)
Relationship duration squared	-0.00† (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Age	-0.19 (0.13)	-0.14 (0.12)	-0.14 (0.12)	-0.03 (0.12)
Time to pregnancy and time in study				
Time to pregnancy	0.12*** (0.03)	0.11*** (0.03)	0.11** (0.03)	0.09** (0.03)
Time to pregnancy squared	-0.00** (0.00)	-0.00** (0.00)	-0.00* (0.00)	-0.00* (0.00)
Total weeks in study	-0.03*** (0.00)	-0.03*** (0.00)	-0.03*** (0.00)	-0.02*** (0.00)
Constant	-1.17 (2.40)	-0.33 (2.33)	-0.38 (2.33)	-2.96 (2.29)
Lnsig2u	0.22 (0.33)	0.05 (0.34)	0.03 (0.34)	-0.42 (0.43)
Observations (weeks)	54,884	54,884	54,884	54,884
Respondents	951	951	951	951

Note: Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

Appendix A: Results from Logistic Regressions with *Random Effects* Estimating Sexual Activity and Contraception Use

	Sexually active		Used any contraception		Used contraception every time	
	XIV	XV	XVI	XVII	XVIII	XIX
Desires and attitudes						
Desire to have sex	0.34*** (0.01)	0.33*** (0.01)	-0.02 (0.04)	-0.04 (0.04)	0.03 (0.03)	0.01 (0.03)
Desire to avoid pregnancy	-0.23*** (0.02)	-0.22*** (0.02)	0.64*** (0.03)	0.63*** (0.03)	0.48*** (0.03)	0.47*** (0.03)
Contraceptive opposition scale	0.02 (0.02)	0.02 (0.02)	-0.17*** (0.04)	-0.15*** (0.04)	-0.16*** (0.03)	-0.15*** (0.03)
Willing to have sex without contraception	-0.01 (0.01)	-0.01 (0.01)	-0.15*** (0.03)	-0.15*** (0.03)	-0.19*** (0.02)	-0.19*** (0.02)
Time-varying demographic controls						
Education (ref: <H.S.)						
Graduated H.S., not enrolled	0.09 (0.08)	0.08 (0.08)	-0.44** (0.15)	-0.46** (0.15)	-0.19 (0.12)	-0.23† (0.12)
Enrolled in or graduated post-secondary	-0.11 (0.08)	-0.08 (0.08)	-0.18 (0.17)	-0.27 (0.17)	0.14 (0.13)	0.07 (0.13)
Employed	0.08† (0.04)	0.07† (0.04)	0.33*** (0.10)	0.28** (0.10)	0.17* (0.07)	0.14† (0.07)
Relationship duration	0.00*** (0.00)	0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)
Relationship duration squared	-0.00*** (0.00)	-0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)	-0.00 (0.00)	-0.00 (0.00)
Age	-0.17*** (0.02)	-0.16*** (0.02)	-0.26*** (0.06)	-0.28*** (0.06)	-0.19*** (0.04)	-0.20*** (0.04)
Time-invariant demographic controls						
African American		-0.49*** (0.15)		-0.28 (0.26)		-0.58** (0.21)
Childhood socioeconomic disadvantage (0-4)		0.04 (0.06)		-0.48*** (0.12)		-0.43*** (0.09)
Age at 1 st intercourse (ref: not active a baseline)						
<=14 years		3.29*** (0.23)		-1.31** (0.46)		-1.05** (0.36)
15-16 years		3.08*** (0.19)		-0.77† (0.42)		-0.92** (0.32)
>=17 years		2.83*** (0.19)		-0.28 (0.44)		-0.76* (0.33)
Constant	1.80*** (0.42)	-0.72 (0.45)	7.06*** (1.14)	8.97*** (1.24)	3.40*** (0.81)	5.30*** (0.88)
Ln _{sig2u}	1.52*** (0.07)	1.15*** (0.07)	1.87*** (0.11)	1.79*** (0.11)	1.71*** (0.09)	1.61*** (0.09)
Observations (weeks)	54,884	54,884	17,981	17,981	17,981	17,981
Respondents	951	951	757	757	757	757

Note: *Used any contraception* and *used contraception every time* are estimated only among sexually active weeks.

Standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05, † p<0.1

References

- Aarons, Sigrid J, and Renee R Jenkins. 2002. "Sex, pregnancy, and contraception-related motivators and barriers among Latino and African-American youth in Washington, DC." *Sex Education: Sexuality, Society and Learning* 2(1):5-30.
- Ariely, Dan, and George Loewenstein. 2006. "The heat of the moment: The effect of sexual arousal on sexual decision making." *Journal of Behavioral Decision Making* 19(2):87-98.
- Armstrong, Elizabeth A., Paula England, and Alison C. K. Fogarty. 2012. "Accounting for women's orgasm and sexual enjoyment in college hookups and relationships." *American Sociological Review* 77(3):435-62.
- Avis, Nancy E, Sarah Brockwell, John F Randolph Jr, Shunhua Shen, Virginia S Cain, Marcia Ory, and Gail A Greendale. 2009. "Longitudinal changes in sexual functioning as women transition through menopause: results from the Study of Women's Health Across the Nation (SWAN)." *Menopause (New York, NY)* 16(3):442.
- Bachrach, Christine A, and S Philip Morgan. 2013. "A cognitive-social model of fertility intentions." *Population and Development Review* 39(3):459-85.
- Barber, Jennifer S. 2011. "The Theory of Planned Behaviour: considering drives, proximity and dynamics." *Vienna yearbook of population research/Vienna Institute of Demography, Austrian Academy of Sciences* 9:31.
- Barber, Jennifer S., Jennifer Eckerman Yarger, and Heather H. Gatny. 2015. "Black-White Differences in Attitudes Related to Pregnancy Among Young Women." *Demography* 52(3):751-86.
- Bearak, Jonathan Marc. 2014. "Casual Contraception in Casual Sex: Life-Cycle Change in Undergraduates' Sexual Behavior in Hookups." *Social Forces* 93(2):483-513.
- Bitzer, Johannes, Annamaria Giralaldi, and Jim Pfaus. 2013. "Sexual desire and hypoactive sexual desire disorder in women. Introduction and overview. Standard operating procedure (SOP Part 1)." *The Journal of Sexual Medicine* 10(1):36-49.
- Blinn-Pike, Lynn. 1999. "Why abstinent adolescents report they have not had sex: Understanding sexually resilient youth." *Family Relations*:295-301.
- Bongaarts, John. 1978. "A Framework for Analyzing the Proximate Determinants of Fertility." *Population and Development Review* 4(1):105-32.
- Cha, Eun Seok, Willa M Doswell, Kevin H Kim, Denise Charron-Prochownik, and Thelma E Patrick. 2007. "Evaluating the theory of planned behavior to explain intention to engage in premarital sex amongst Korean college students: A questionnaire survey." *International Journal of Nursing Studies* 44(7):1147-57.
- Christopher, F Scott, and Susan Sprecher. 2000. "Sexuality in marriage, dating, and other relationships: A decade review." *Journal of Marriage and Family* 62(4):999-1017.
- Dennis, Amanda, and Daniel Grossman. 2012. "Barriers to Contraception and Interest In Over - the - Counter Access Among Low - Income Women: A

- Qualitative Study." *Perspectives on sexual and reproductive health* 44(2):84-91.
- Fennell, Julie. 2014. "'And Isn't that the point?': pleasure and contraceptive decisions." *Contraception* 89(4):264-70.
- Fishbein, Martin, and Icek Ajzen. 2011. *Predicting and changing behavior: The reasoned action approach*: Taylor & Francis.
- Foster, Diana Greene, Jenny A Higgins, Deborah Karasek, Sandi Ma, and Daniel Grossman. 2012. "Attitudes toward unprotected intercourse and risk of pregnancy among women seeking abortion." *Women's Health Issues* 22(2):e149-e55.
- Friedman, Debra, and Michael Hechter. 1988. "The Contribution of Rational Choice Theory to Macrosociological Research." *Sociological Theory* 6(2):201-18.
- Gelman, Andrew, and Jennifer Hill. 2007. *Data Analysis Using Regression and Multilevel/ Hierarchical Models*. Cambridge: Cambridge University Press.
- Gerrard, Meg. 2013. "Health Images and Their Effects on Health Behavior." *Health, Coping, and Well-being: Perspectives From Social Comparison Theory*:63.
- Godin, Gaston, and Gerjo Kok. 1996. "The theory of planned behavior: a review of its applications to health-related behaviors." *American journal of health promotion* 11(2):87-98.
- Hällström, Tore, and Sverker Samuelsson. 1990. "Changes in women's sexual desire in middle life: The longitudinal study of women in Gothenburg." *Archives of Sexual Behavior* 19(3):259-68.
- Higgins, Jenny A, and Jennifer S Hirsch. 2008. "Pleasure, power, and inequality: incorporating sexuality into research on contraceptive use." *American Journal of Public Health* 98(10):1803-13.
- Horne, Sharon, and Melanie J Zimmer-Gembeck. 2005. "Female sexual subjectivity and well-being: Comparing late adolescents with different sexual experiences." *Sexuality Research and Social Policy* 2(3):25-40.
- Impett, Emily A, and Letitia A Peplau. 2003. "Sexual compliance: Gender, motivational, and relationship perspectives." *Journal of Sex Research* 40(1):87-100.
- Impett, Emily A, and Deborah L Tolman. 2006. "Late adolescent girls' sexual experiences and sexual satisfaction." *Journal of Adolescent Research* 21(6):628-46.
- Jadack, Rosemary A, Anne Fresia, Anne M Rompalo, and Jonathan Zenilman. 1997. "Reasons for not using condoms of clients at urban sexually transmitted diseases clinics." *Sexually transmitted diseases* 24(7):402-08.
- Jemmott 3rd, JB, Loretta S Jemmott, and Candice I Hacker. 1991. "Predicting intentions to use condoms among African-American adolescents: the theory of planned behavior as a model of HIV risk-associated behavior." *Ethnicity & disease* 2(4):371-80.
- Kaplan, Helen Singer. 1995. *The sexual desire disorders: Dysfunctional regulation of sexual motivation*: Psychology Press.
- Kisker, Ellen Eliason. 1985. "Teenagers talk about sex, pregnancy and contraception." *Family Planning Perspectives* 17(2):83-90.

- Klobas, Jane. 2011. "The Theory of Planned Behaviour as a model of reasoning about fertility decisions." *Vienna Yearbook of Population Research* 9:47-54.
- Klusmann, Dietrich. 2002. "Sexual motivation and the duration of partnership." *Archives of Sexual Behavior* 31(3):275-87.
- Kuiper, Heather, Suellen Miller, Elena Martinez, Lisa Loeb, and Philip Darney. 1997. "Urban adolescent females' views on the implant and contraceptive decision-making: a double paradox." *Family Planning Perspectives*:167-72.
- Levine, Stephen B. 2003. "The nature of sexual desire: A clinician's perspective." *Archives of Sexual Behavior* 32(3):279-85.
- Lindgren, Kristen P, Rebecca L Schacht, Peter M Mullins, and Jessica A Blayney. 2011. "Cognitive representations of sexual self differ as a function of gender and sexual debut." *Archives of Sexual Behavior* 40(1):111-20.
- Loewenstein, George, and Frank Furstenberg. 1991. "Is Teenage Sexual Behavior Rational? ." *Journal of Applied Social Psychology* 21(12):957-86.
- Martin, Karin. 1996. *Puberty, Sexuality, and the Self: Girls and Boys at Adolescence*. New York: Routledge.
- Meston, Cindy M, and David M Buss. 2007. "Why humans have sex." *Archives of Sexual Behavior* 36(4):477-507.
- Moholy, Maxwell, Nicole Prause, Greg Hajcak Proudfit, Ardesir S. Rahman, and Timothy Fong. 2015. "Sexual desire, not hypersexuality, predicts self-regulation of sexual arousal." *Cognition and Emotion* 29(8):1505-16.
- Norris, Jeanette, Susan A Stoner, Danielle M Hessler, Tina Zawacki, Kelly C Davis, William H George, Diane M Morrison, Michele R Parkhill, and Devon A Abdallah. 2009. "Influences of sexual sensation seeking, alcohol consumption, and sexual arousal on women's behavioral intentions related to having unprotected sex." *Psychology of Addictive Behaviors* 23(1):14.
- Paradise, Jan E., Jennifer Cote, Sara Minsky, Ana Lourenco, and Jonathan Howland. 2001. "Personal values and sexual decision-making among virginal and sexually experienced urban adolescent girls." *Journal of Adolescent Health* 28(5):404-09.
- Prinstein, Mitchell J, Christina S Meade, and Geoffrey L Cohen. 2003. "Adolescent oral sex, peer popularity, and perceptions of best friends' sexual behavior." *Journal of Pediatric Psychology* 28(4):243-49.
- Regan, Pamela C, and Ellen Berscheid. 1995. "Gender differences in beliefs about the causes of male and female sexual desire." *Personal Relationships* 2(4):345-58.
- . 1996. "Beliefs about the state, goals, and objects of sexual desire." *Journal of Sex & Marital Therapy* 22(2):110-20.
- Reinecke, Jost, Peter Schmidt, and Icek Ajzen. 1996. "Application of the theory of planned behavior to adolescents' condom use: A panel study1." *Journal of Applied Social Psychology* 26(9):749-72.
- Schachner, Dory A, and Phillip R Shaver. 2004. "Attachment dimensions and sexual motives." *Personal Relationships* 11(2):179-95.
- Schalet, Amy T. 2011. *Not under my roof*: University of Chicago Press.
- Sieving, Renee E, Marla E Eisenberg, Sandra Pettingell, and Carol Skay. 2006. "Friends' influence on adolescents' first sexual intercourse." *Perspectives on Sexual and Reproductive Health* 38(1):13-19.

- Sutton, Stephen, Dominic McVey, and Alan Glanz. 1999. "A comparative test of the theory of reasoned action and the theory of planned behavior in the prediction of condom use intentions in a national sample of English young people." *Health Psychology* 18(1):72.
- Thornton, Arland, and Donald Camburn. 1989. "Religious participation and adolescent sexual behavior and attitudes." *Journal of Marriage and the Family*:641-53.
- Tolman, Deborah L. 2009. *Dilemmas of desire: Teenage girls talk about sexuality*: Harvard University Press.
- Udry, J Richard, and John OG Billy. 1987. "Initiation of coitus in early adolescence." *American Sociological Review*:841-55.
- Watkins, Susan Cotts. 1993. "If all we knew about women was what we read in Demography, what would we know?" *Demography* 30(4):551-77.
- Winters, Jason. 2010. "Hypersexual disorder: A more cautious approach." *Archives of Sexual Behavior* 39(3):594-96.
- Winters, Jason, Kalina Christoff, and Boris B Gorzalka. 2010. "Dysregulated sexuality and high sexual desire: Distinct constructs?" *Archives of Sexual Behavior* 39(5):1029-43.