

Adolescent Reproductive Attitudes, Knowledge, and Sexual Partnerships in Young Adulthood: Variation by Gender

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Abstract

Although prior research on gender differences in sexual behaviors have been studied extensively, less attention has been given to understanding the psychosocial influences on sexual behavior for young adult men and women. Prior work has identified two potential sets of factors – *reproductive attitudes and reproductive knowledge*, both of which are multidimensional – that might affect sexual partnerships. In this paper, we use the National Longitudinal Survey of Adolescent to Adult Health (Add Health) to test whether these two concepts, measured in adolescence (Wave I), are associated with various measures of sexual partners in adulthood (Wave IV). Our preliminary results show a number of gender differences and similarities in adolescent reproductive knowledge and attitudes and the associations with the number and type of sex partners in young adulthood. These results have implications for better understanding outcomes such as STI/STD prevention and unintended fertility.

While sexual activity becomes nearly universal during the adolescent and young adult years (Halpern & Haydon, 2012), there are inherent risks to engaging in sexual activity. Individuals who have fewer lifetime sexual partners have a reduced risk of experiencing a number of sex-related consequences such as STI/STD diagnosis and unintended pregnancy (Kahn & Halpern, 2018). Therefore, it is important to understand the factors that predict sexual partnerships in adulthood.

Prior work examining the number of sexual partners in young adulthood has focused on differences across a variety of sociodemographic factors such as maternal education, family structure, and race/ethnicity (Santelli et al, 1998; Santelli, Lowry, Brener, & Robin, 2000) as well as physical development and sex-related factors such as pubertal timing and age at first sex, (Harden, 2012; Heywood, Patrick, Smith, & Pitts, 2015; Kahn & Halpern, 2018). Additionally, research using large nationally representative data sets (e.g., Add Health) has found very small differences between young adult men and women in the number of sexual partners (Petersen & Hyde, 2011; Wells & Twenge, 2005), with men reporting slightly more partners. However, less research has focused on gender differences in adolescent attitudes and knowledge about pregnancy and contraception and how they might influence sexual behaviors, specifically the number and type of sexual partners, which is the focus of this paper.

Psychosocial literature shows that knowledge and attitudes about contraception and pregnancy influence reproductive behaviors (Bachrach & Morgan, 2013; Fishbein & Ajzen, 2010; Guzzo et al, forthcoming; Miller 1994, 1995; Miller, Severy, & Pasta, 2004; Philipov, Thévenon, Klobas, Bernardi, & Liefbroer, 2009). Attitudes about childbearing and contraception likely affect sexual as well, given the link between sex, contraception, and reproduction (Bongaarts, 1978). But because of the multiple societal meanings linked to sexual behavior,

these associations may be especially complex according to gender. Sex brings benefits, like physical pleasure and closeness with partners but, especially for girls, it is often stigmatized as a cause for embarrassment, shame, or guilt. Fear of pregnancy, potentially compounded by moral and relational concerns over the acceptability of contraception, may spill over into negative attitudes about sex. Put together, this suggests that perceiving more negative consequences toward early reproduction or having negative attitudes toward contraception may limit sexual behavior, but primarily for women. Additionally, many adolescent boys and girls lack accurate knowledge about reproductive biology and contraception, which could affect adult sexual behaviors. For instance, failing to accurately understand the risks of pregnancy due to sex may lead to more sex partners. It is also possible that accurate information can increase the chances of having more sex partners; individuals who understand how to protect themselves using contraception may have more partners than those who do not feel able to mitigate the risks of sex. Whether this process works similarly across gender is unclear, in part because there is evidence that girls and boys often learn about different things during sex ed (Lindberg, Maddow-Zimet, & Boonstra, 2016).

In this paper, we seek to answer the question: Are there gender differences how adolescent reproductive attitudes and knowledge predict sexual behaviors in young adulthood?

Data and methods

This paper used the National Longitudinal Survey of Adolescent to Adult Health (Add Health). Add Health is a nationally representative study that has been widely used to study sexual and reproductive behavior among adolescents and young adults. The target population of Add Health was adolescents in grades 7-12 (ages 12-19) in the United States in 1995. Respondents were re-interviewed in 1996, 2001-2002, and 2007-2008. In the current analyses,

we focus on women and men aged 15 and older (who were asked the key attitudinal and knowledge questions, discussed below) and who participated in Wave IV and had valid survey weights.

Key Independent Variables

We first identified items potentially reflecting reproductive attitudes (16) and reproductive knowledge (13) in Wave I. We then conducted both exploratory and confirmatory factor analyses (EFA and CFA, respectively) in Mplus 7 to identify the underlying constructs for reproductive attitudes and reproductive knowledge, if any. We compared the fit of models with different numbers of items and factors using two goodness-of-fit criteria, Root Mean Squared Error of Approximation (RSMEA) and Comparative Fit Index (CFI), and we conducted a chi-square test of model fit to determine significant differences in the improvement of model fit across models (Hu & Bentler, 1999). RSMEA values of .01, .05, and .08 are indicators of excellent, good, and mediocre fit, respectively (Brown & Cudeck, 1992; MacCallum, Browne, & Sugawara, 1996). We used a cutoff of .05 or lower to indicate a good-fitting model. The CFI ranges from 0 (poor fit) to 1 (perfect fit), and values of a .90 or higher provide evidence for adequate model fit, with scores above .95 indicating excellent fit (Hu & Bentler, 1999). More details on this process can be found in Guzzo et al. (forthcoming).

The resulting factor structure for reproductive attitudes used 12 of the 16 items and contained three factors (Table 1). The first factor, which we term *feelings toward pregnancy*, assesses how respondents feel about a hypothetical pregnancy. The second factor, which we term *birth control attitudes*, represents the respondent's overall orientation towards contraception; we interpret this as how "costly" (on a social, relational, and financial basis) it is to take steps to avoid pregnancy. The final factor, which we term *life course consequences*, measures how a

hypothetical pregnancy, and specifically a pregnancy at during adolescence, would impact particular aspects of the respondent's life. Note that items are recoded so that higher scores reflect a stronger orientation toward preventing pregnancy (less favorable attitudes toward pregnancy/childbearing or more favorable attitudes toward birth control). For reproductive knowledge, the factor structure used 9 of the 13 items and contained three factors (Table 1). The first factor, which we term *female reproductive biology knowledge*, represents respondents' knowledge of the physiological aspects of female reproduction. The second factor, which we term *condom knowledge*, describes the respondent's overall knowledge of condoms and how to use them effectively. The final factor, which we term *birth control confidence*, identifies how confident individuals feel about their general knowledge of some specific contraceptive methods. Reproductive knowledge items are recoded so that higher scores reflect more accurate knowledge and greater confidence. We chose to use simple averages of the items for each of the 3 factors in the reproductive attitude factors and for each of the 3 factors in the reproductive knowledge factors rather than factor scores in this paper because the former are more intuitive and straightforward to interpret in our analyses. Each of the averages for the three reproductive attitudes measures ranges from 1-5, and the averages of the three reproductive knowledge items range from 0-1.

- Table 1 here -

Dependent Variables

We have four indicators of sexual partnerships for men and women, all drawn from Wave IV. First, we measured the *lifetime of opposite-sex partners* for women and men, using the question(s): "Considering all types of sexual activity, with how many male/female partners have you ever had sex?" We topcoded responses at 6 or more, and so this measures ranges from 0 to 6

or more partners. Second, we have an indicator of the *lifetime number of 'one night stands'*, ranging from 0 to 6 or more partners (topcoded), for men and women using the question: “considering all types of sexual activity, with how many partners, male or female, have you had sex on one and only one occasion?” Third, we have indicators of the *number of opposite-sex partners in the past 12 months* for women and men, ranging from 0 to 6 or more partners (topcoded), using the question: “considering all types of sexual activity, with how many male/female partners have you had sex in the past 12 months?” Finally, we have an indicator of if respondents had *concurrent sex partners in the past 12 months*, using the question: “In the past 12 months, did you have sex with more than one partner at around the same time?” Response categories were “yes”, coded as 1 and “no” coded as 0.

Preliminary analyses

We begin by presenting descriptive statistics by gender for our four outcome variables and the reproductive attitudes and knowledge measures. Next, we show basic regression models, without covariates, for men and women separately. We use OLS regression to predict: (1) lifetime number of opposite-sex partners by Wave IV, (2) lifetime number of “one night stands” by Wave IV, and (3) number of opposite-sex partners in the past 12 months at Wave IV. We used logistic regression to predict the odds of having engaged in concurrent sex in past 12 months at Wave IV. Sample sizes vary according to the outcome. All analyses incorporated design effects using Stata 14’s *svy* commands. In the final version of this paper, we will include a number of covariates in our multivariate analyses, all measured at Wave I. First, we will include a number of socioeconomic and demographic control variables including: age, race-ethnicity, family structure, and maternal education. Second, we will include psychosocial measures including a dichotomous indicator of whether the respondent highly expects to attend

college, a measure of aptitude (adapted from the Peabody Picture Vocabulary Test), and religiosity (a scaled variable of four items about religious service attendance, prayer, and importance, $\alpha = 0.85$). We will also include measures specifically linked to sex, including: sexual self-efficacy, self-reported pubertal timing, age of first sex, and a set of three *attitudes toward sex* factors that we tested for using exploratory and confirmatory factor in previous work using questions from Wave I of Add Health. Similar to our reproductive knowledge and reproductive attitude factors, we will take the averages of each of the items in each factor that create our three *attitudes toward sex* latent constructs.

Preliminary Results

Descriptive Statistics

Table 2 shows the weighted descriptive statistics and the means for each of the reproductive attitude and the reproductive knowledge factors. For both lifetime opposite-sex sexual partners and opposite-sex sexual partners in the past year, men reported significantly more partners. Women reported significantly fewer (1.32) lifetime number of “one night stands” compared to men (2.45) by Wave IV. In addition, women indicated having significantly fewer concurrent sex partners (12%) in the past year compared to men (20%).

Turning to the reproductive attitude and reproductive knowledge measures, men and women had similar levels of reproductive attitudes, with women having significantly more positive attitudes toward birth control (4.09) compared to men (3.84) and women perceiving significantly greater life course consequences to having a child as an adolescent (3.42) compared to men (3.34). Accuracy in the reproductive knowledge item “female reproductive biology knowledge” was similar for adolescent men and women. However, women (0.76) reported

significantly higher levels of accuracy for condom knowledge compared to men (0.72). Finally, compared to women (0.70), men (0.74) indicated greater birth control confidence.

- Table 2 here -

Lifetime number of opposite-sex sexual partners

Table 3 shows the coefficients from the OLS regression models for lifetime sexual partnerships for women and men. For women, perceiving more negative *life course consequences* for having a child in adolescence is associated with fewer opposite-sex partners by Wave IV. For men, *life course consequences* are not associated with the number of opposite-sex sexual partners; however, more positive *attitudes toward birth control* are associated with fewer opposite-sex partners by Wave IV. Women and men have similar results when assessing adolescent *condom knowledge* and *birth control confidence*. For both groups, having more knowledge of condoms and greater confidence in using birth control in adolescence is associated with more opposite-sex sexual partners by Wave IV.

- Table 3 here -

Lifetime number of “one night stand” partners

For women, having more negative *feelings toward pregnancy* in adolescence are associated with fewer “one night stands” by Wave IV. In contrast, for men, more negative *feelings toward pregnancy* in adolescence are associated with more “one night stands” by Wave IV. In addition, similar to the lifetime number of opposite-sex sexual partners, more positive *attitudes toward birth control* are associated with fewer “one night stand” partners by Wave IV for men. Women and men have similar results when assessing adolescent *condom knowledge* and *birth control confidence*. For both women and men, having more knowledge of condoms and

greater confidence in using birth control in adolescence is associated with more “one night stand” partners by Wave IV.

Number of opposite-sex partners in the past year

Table 4 shows the coefficients from the OLS regression models for the number of opposite-sex (any sex act) in the past 12 months and the logistic regression coefficients for concurrent sexual partners in the past 12 months for women and men. Looking first at the number of partners in the past year, for women, having more negative *feelings toward pregnancy* in adolescence are associated with fewer opposite-sex sexual partners in the past year at Wave IV. For men, *feelings toward pregnancy* was not significant, however, more positive *attitudes toward birth control* and perceiving more negative *life course consequences* due to having a child in adolescence are associated with having fewer opposite-sex partners in the past year at Wave IV. None of the reproductive knowledge items are significant.

- Table 4 here -

Concurrent sex partners in the past year

Turning to concurrent sex partners in the past year, similar patterns and directions of significance emerge as they did for number of opposite-sex partners in the past year. For women, having more negative *feelings toward pregnancy* in adolescence are associated with a lower odds of having concurrent sexual partners in the past year at Wave IV. For men, *feelings toward pregnancy* was not significant, however, more positive *attitudes toward birth control* and perceiving more negative *life course consequences* due to having a child in adolescence are associated with a lower odds of having concurrent sexual partners in the past year in the past year. None of the reproductive knowledge items are significant.

Discussion and next steps

With these preliminary results, we tested if reproductive attitudes and knowledge in adolescence were linked to two indicators of lifetime sexual activity and two indicators of recent sexual activity for young adult men and women. We found that adolescent reproductive attitudes and knowledge are indeed salient predictors of the number and type of sex partners in young adulthood. We highlight a few key findings. First, for the lifetime sexual partner outcomes (Table 3), we can observe that knowledge about contraception matters (condom knowledge and birth control confidence) and operate similarly according to gender. Reproductive attitudes were significant as well for lifetime outcomes, but they operate differently for young adult men and women.

Second, when we turn to the sexual partners in the past year outcomes (Table 4), reproductive knowledge items were not salient predictors. Instead, reproductive attitudes from adolescence were associated with sex behaviors in the past year and operated differently according to gender. For the outcomes capturing sexual behavior in the past year, it appears that adolescent reproductive attitudes – but not knowledge – influence recent sexual behaviors.

In these preliminary analyses, we included averages of the reproductive knowledge factor items (biology knowledge, condom knowledge, birth control knowledge) and reproductive attitude factor items (feelings toward pregnancy, birth control attitudes, and life course consequences) in our regression analyses. The completed paper will include a number of covariates in our analysis to account for socioeconomic, demographic, psychosocial background measures, and sex related items. In addition, we plan to further understand and extrapolate on the gender differences and similarities by conducting formal tests across models.

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Table 1. Reproductive Attitudes and Knowledge Measures in Add Health (Wave I)

Reproductive Attitudes		Reproductive Knowledge	
<i>Feelings toward Pregnancy</i>	<p>Getting pregnant at this time in your life is one of the worst things that could happen to you.</p> <p>It wouldn't be all that bad if you got pregnant now.</p>	<i>Female Reproductive Biology Knowledge</i>	<p>The most likely time for a woman to get pregnant is right before her period starts.</p> <p>In general, a woman is most likely to get pregnant if she has sex during her period, as compared with other times of the month.</p>
<i>Birth Control Attitudes</i>	<p>Using birth control is morally wrong. In general, birth control is too much of a hassle to use.</p> <p>It takes too much planning ahead of time to have birth control on hand when you're going to have sex.</p> <p>It {IS/WOULD BE} too hard to get a {GIRL/BOY} to use birth control with you.</p> <p>For you, using birth control interferes/would interfere with sexual enjoyment</p> <p>In general, birth control is too expensive to buy.</p>	<i>Condom Knowledge</i>	<p>Even if the man pulls out before he ejaculates, even if ejaculation occurs outside of the woman's body, it is still possible for the woman to become pregnant.</p> <p>When putting on a condom, it is important to have it fit tightly, leaving no space at the tip.</p> <p>Vaseline can be used with condoms, and they work just as well.</p> <p>As long as the condom fit over the tip of the penis, it doesn't matter how far down it is unrolled.</p>
<i>Life Course Consequences</i>	<p>If you got pregnant, you would be forced to grow up too fast.</p> <p>If you got pregnant, you would have to quit school.</p> <p>If you got (If R is male, add: someone) pregnant, it would be embarrassing for your family.</p> <p>If you got pregnant (If R is male, add: someone), it would be embarrassing for you.</p>	<i>Birth Control Confidence</i>	<p>You are quite knowledgeable about the rhythm method of birth control and when it is a "safe" time during the month for a woman to have sex and not get pregnant.</p> <p>You are quite knowledgeable about how to use a condom correctly.</p> <p>You are quite knowledgeable about the withdrawal method of birth control.</p>

Table 2. Weighted Descriptive Statistics

	Women	Men
	Mean/%	Mean/%
Dependent Variables (Wave IV)		
Lifetime number of opposite-sex sexual partners (any sex act)	4.41 ^a	4.67
Lifetime number of sexual partners "One night stand"	1.87 ^a	2.45
Number of opposite-sex sexual partners in last 12 months (any sex act)	1.32 ^a	1.67
Had concurrent sex partners in last 12 months	12% ^a	20%
Independent Variables (Wave I)		
<i>WI Reproductive Attitudes (range 1-5)</i>		
Feelings toward Pregnancy	4.26	4.29
Birth Control Attitudes	4.09 ^a	3.84
Life Course Consequences	3.42 ^a	3.34
<i>WI Reproductive Knowledge (range 0-1)</i>		
Female Reproductive Biology Knowledge	0.53	0.51
Condom Knowledge	0.76 ^a	0.72
Birth Control Confidence	0.70 ^a	0.74

^a Significant differences between women and men

Table 3. OLS regression models for lifetime sexual partners for men and women by Wave IV of Add Health

	Lifetime opposite-sex sexual partners (any sex act)				Lifetime number sexual partners "One night stand"							
	women (n=4,299)		men (n=4,239)		women (n=4,508)		men (n=4,142)					
	b	SE	b	SE	b	SE	b	SE				
<i>WI Reproductive Attitudes</i>												
Feelings toward Pregnancy	-0.047	0.053	0.000	0.066	-0.133	0.052	**	0.136	0.067	*		
Birth Control Attitudes	0.116	0.065	-0.171	0.050	**	0.083	0.056	-0.196	0.063	**		
Life Course Consequences	-0.213	0.042	***	-0.157	0.058	0.040	0.053	-0.012	0.063			
<i>WI Reproductive Knowledge</i>												
Female Reproductive Biology Knowledge	0.143	0.093		-0.009	0.121	0.141	0.101	0.155	0.112			
Condom Knowledge	1.007	0.169	***	0.456	0.145	**	0.961	0.176	***	0.868	0.194	***
Birth Control Confidence	0.908	0.111	***	0.738	0.126	***	0.340	0.115	**	0.425	0.147	**
R ²	0.070		0.030		0.021		0.018					

* p < .05; ** p < .01; *** p < .001

Table 4. OLS and Logistic regression models for sexual partners in the past 12 months for men and women at Wave IV of Add Health

	12mo opposite-sex sexual partners (any sex act)					12mo concurrent sex partners						
	women (n=4,209)		men (n=3,995)			women (n=4,032)		men (n=3,883)				
	b	SE	b	SE	coef.	SE	coef.	SE				
<i>WI Reproductive Attitudes</i>												
Feelings toward Pregnancy	-0.043	0.021	*	-0.044	0.046		-0.192	0.090	*	-0.040	0.076	
Birth Control Attitudes	-0.027	0.024		-0.106	0.038	**	-0.170	0.092		-0.192	0.075	*
Life Course Consequences	-0.035	0.020		-0.065	0.033	*	-0.007	0.084		-0.188	0.066	**
<i>WI Reproductive Knowledge</i>												
Female Reproductive Biology Knowledge	-0.038	0.041		0.124	0.080		-0.254	0.149		0.205	0.152	
Condom Knowledge	0.163	0.085		-0.045	0.146		0.314	0.340		0.152	0.242	
Birth Control Confidence	0.037	0.049		0.101	0.089		0.059	0.221		-0.171	0.183	
R ²	0.010			0.010								

* p < .05; ** p < .01; *** p < .001