Adolescent Sex, Mental Health and Academic Engagement: The Role of Norms

Adolescent sexual intercourse has clear and direct links to several aspects of physical health: the U.S. teen pregnancy rate is 71 (per 1000 girls 15-19), the teen birth rate is 42, and recent estimates indicate that one in four teen girls (38% of sexually experienced teen girls) have a sexually transmitted infection (STI) (Forhan et al. 2009; Ventura et al. 2009). We know less about how sexual activity influences other outcomes that shape well-being in adolescence and at later stages in the life course. Prior research links adolescent sex to depression (Longmore et al. 2004; Hallfors et al. 2005), disinterest in education (Billy et al. 1988; Sabia 2007; Schvaneveldt et al. 2001), and risky behaviors (e.g., drug use; see Armour & Haynie 2007; Elliott & Morse 1989). Yet the mechanisms underlying these associations remain ambiguous.

In this paper we examine the degree to which the effects of sex on depression, GPA, and school problems vary based on gender and age and across school contexts. We argue that these attributes are associated with variation in norms about sexual behavior and thus in the social (dis)comfort associated with sexual experimentation.

Emerging evidence suggests that the normative context in which sex occurs contributes to its negative consequences (McCarthy & Casey 2008; McCarthy & Grodsky 2010; Meier 2007). For adolescents, the school, home and peer group are the social contexts that frame much of their day to day experience. The behaviors and attitudes of those who constitute these contexts may be key determinants of the social and psychological consequences associated with adolescent sex. We argue that it is not the physical act of intercourse that leads adolescents to become depressed, engage in risky behaviors or stop attending classes. Rather, it is the social meaning of the act that determines the magnitude of the adverse effects of sex, if any, on adolescent well-being. That meaning, we contend, is a product of sex norms.

We distinguish between **global** and **local** norms that shape the social meaning of sex. Global norms reflect general societal expectations that are typically reinforced by parents, peers, and classmates. These global norms are more accepting of sex among older teens, boys, and those in romantic relationships (Carpenter 2005; Giordano et al. 2006a; Martin 1996; Thompson 1995, Tolman 2002). Local norms, in contrast, characterize more immediate social settings and may reinforce, modify or repudiate global norms (Hechter and Opp 2001:399). In adolescence, the attitudes and behaviors of peers are important sources for local norms, particularly for sex (Cavanagh 2007). Peers in friendship groups and in larger organizational settings like schools communicate local norms and their corresponding sanctions; they punish norm violations and reinforce the internal sanctioning expected of norm violators.

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Consensual sexual activity typically begins in adolescence and most research finds a positive correlation between teen sex and depressive symptoms (Rector et al. 2003; Hallfors et al. 2005). However, other studies report that prior depression and self-esteem predict sexual onset (Longmore et al. 2004) and that failing to take account of this selection leads to biased estimates of the unique contribution of sexual activity to adolescent depression. Prior research tells a more nuanced story about how global norms shape how sex affects, or does not affect, adolescents' mental health. Most teens first experience sex in a romantic relationship, but about

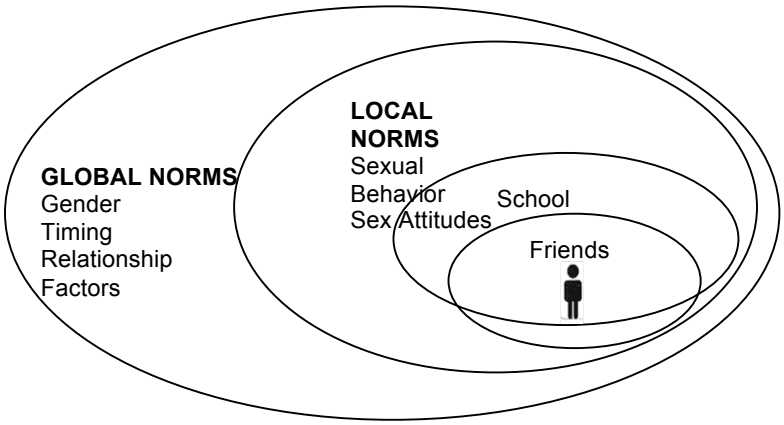
a quarter report first sex with someone other than a romantic partner (Abma et al. 2004; Manning et al. 2006; Giordano et al. 2006b). Meier's (2007) findings indicate that teen sex in romantic relationships that are short-lived and not emotionally close (e.g. a "hook-up") is not normative, and increases depression and reduces self-esteem, especially for girls. Likewise, sex that occurs early relative to age norms is associated with increases in depression for girls. However, sex is not associated with mental health detriments for teens that follow global norms by having sex "on-time", with a romantic partner, and/or in a committed relationship. Other research supports the notion that global norms about the relationship context of sex (e.g., commitment) shape the effect of sex on mental health (Simmons et al. 1979; Joyner & Udry 2000; Sprecher et al. 1995).

Several studies find that adolescent sex diminishes high school success (e.g., Billy et al. 1988; Schvaneveldt et al. 2001). Yet, most of this research ignores the normative context in which sex occurs. In a recently completed study, we argue that global norms about the relationship context of teen sex shape the effects sex has on education (McCarthy & Grodsky 2011). In that study we distinguish among four types of youth: those who abstain from sex; those who have sex only in romantic relationships (conforming to global norms); those who have sex only in more casual relationships; and those who engage in sex in both types of relationships. We examine eight measures of educational engagement and find that girls and boys who have sex in causal relationships fare poorly compared to abstainers on over half of those outcomes. In contrast, girls and boys who have sex exclusively in romantic-relationships are not significantly more likely to experience negative educational outcomes than those who abstain on almost all of the outcomes examined.

The Normative Context

Global norms about the appropriate age for sex result in greater disapproval for youth whose sexual activity is "early," and especially for younger youth who have sex in casual, rather than in close relationships. Likewise, the sexual double standard results in more conservative sexual norms for girls than for boys (Crawford & Popp 2003; De Gaston et al. 1996; DeLamater 1981; Kreager & Staff 2009). Teens are intensely aware of these global norms and they influence many of their decisions, including those about sex. In Figure 1 we highlight the role of global norms and underscore the influence of norms from other contexts.

Figure 1: Global and Local Norms Regarding Sexual Activity



The effect that sex has on well-being is likely conditioned by more local contexts in which adolescents live day to day. Although teens' decisions about sex are influenced by parents (Fingerson 2005) their peers are particularly important for framing acceptable sexual

behavior. Youth vary in their views about sex: some strongly support abstinence until marriage, whereas others view sex in adolescence as normative (Bearman & Brückner 2001; Carlson 2005). Adolescents must negotiate these contradictions and many rely on peers to provide guidance on local norms (Rodgers 1996). Recent research using nationally representative data finds that the level of involvement with friends significantly contributes to conceptions of ideal sexual relationships and that these ideals influence whether young people have sexual intercourse; as the author of one study notes, teens rely on their peers for learning the "the ins and outs of romantic life" (Cavanagh 2007:594; also see Diiorio et al. 1999).

Schools are an important site for the production of adolescent culture, including behavioral norms (see e.g., Barrett et al. 2007); aside from the home, adolescents spend more time in the school than in any other single setting. In his classic study, Coleman (1961:287) argued that "[t]he degree to which an adolescent is kept a child or given the freedoms of an adult differs among schools and among the students within a school." Although he was not writing about adolescent sexuality, Coleman's words may pertain to norms about sexual behavior as much as they do to those for other activities**.**

School norms may also be important because of the comparative durability of the school context. High school friendships are often quite fluid, changing from year to year despite the persistence of students in a single high school (Cairns & Cairns 1996; Schneider & Stevenson 1999). The school may therefore provide a more consistent normative framework within which adolescents make sense of their own behavior and the behavior of their peers. Further, because sex is a new, physically, emotionally, and socially charged experience for most adolescents, it is a prime candidate for shaping one's reputation in the broader adolescent community. For example, in their investigation of the effect of "virginity pledging" on sexual debut, Bearman and Brückner (2001) find that the negative effect of pledging is moderated by its normative status in the school (i.e., the proportion of students who pledge). In addition, in their examination of romantic networks, Bearman et al. (2004) reveal an unarticulated but empirically robust school norm: a prohibition against dating the ex-partner of the person that your ex-partner is now dating—or a "seconds partnership."

Data & Measures

We use the Add Health data to investigate teen sex, normative contexts and well-being. The Add Health study is based on a probability sample of U.S. adolescents who were in grades 7-12 in the 1994-1995 school year and attended one of 80 sampled high schools or a middle school feeding into one of those high schools. The final sample included 132 high schools and middle schools from the original 80 strata (Bearman et al. 1997). Approximately 90,000 students completed a self-administered in-school questionnaire in 1994-5. In 1995, the study randomly surveyed a subset of 20,745 students and their parents in their homes to comprise the wave 1 in-home sample. For the preliminary analyses described below, we use only the in-home probability sample for wave 1 and limit our sample to those ages 15 and older in order to include measures of sex attitudes--questions that were asked only of respondents who were at least 15 years of age. We further restricted our sample to those who do not report sex in the context of rape and whose parents are at least 29 years of age. In these preliminary analyses, we use listwise deletion of cases where data are missing on other measures.

Grades are measured as the average of self-reported grades in the last class taken by the adolescent in English or language arts, mathematics, history or social studies, and science. Response options are A, B, C, D or lower and coded with a score of 4 for A, 3 for B, 2 for C, and 1 for D or lower. Items were averaged for a scale score of 1-4 with a higher score indicating better grades (Cronbach's alpha = 0.73). Note that we will substitute transcript for self-reported GPA once we have the transcript data in the next few weeks.

The *school problems* scale (Cronbach's alpha = 0.69) is based on responses to statements regarding how often students have problems getting along with teachers, paying attention, completing homework and getting along with other students. Item scores were averaged for a scale range of 0-4 with a higher score indicating more school problems.

Depressive symptoms (Cronbach's alpha = 0.80) are captured using an additive 9-item version of CES-D scale asking respondents: "How often was each of the following things true during the past week?" 1) you were bothered by things that usually don't bother you; 2) you felt that you could not shake the blues, even with help from family and friends; 3) you felt that you were just as good as other people; 4) you had trouble keeping your mind on what you were doing; 5) you felt depressed; 6) you felt that you were too tired to do things; 7) you enjoyed life; 8) you felt sad; and 9) you felt that people disliked you. Response options for each item were rarely or never (0), sometimes (1), a lot of the time (2), or most of the time or all of the time (3). Items 3 and 7 are reverse coded, and all items are averaged for a scale ranging from 0 to 3, with a higher score indicating more depressive symptoms.

Our key predictors are whether the teen *has had sex* by the wave 1 interview (0/1), if their *age at first sex was greater than 16.5 years*, the mean age for first sex for this cohort (0/1), and *gender by sex interactions*. We also include *individual attitudes towards sex* based on the average of eight items where teens respond with the degree to which they agreed with the following statements: "If you had sexual intercourse…" 1) your friends would respect you more; 2) your partner would lose respect for you; 3) afterward you would feel guilty; 4) it would upset your mother; 5) it would give you a great deal of physical pleasure; 6) it would relax you; 7) it would make you more attractive to women/men; 8) you would feel less lonely (Cronbach's alpha = 0.74). Negatively worded items were reverse coded and all items were averaged so higher scores indicate more permissive attitudes. Finally, we include two school level variables: the *proportion of adolescents in each school that had sex* and the *school average of the attitude measures* described immediately above. We also include a number of control variables that we simply list here for brevity: gender, age, race/ethnicity, and parent education.

Methods

We estimate ordinary least squares models and school linear random effects. We explored several different specifications to try to understand the degree to which norms vary across and within school contexts. The global norms we evaluate in this paper pertain to gender and age at first sex. In our initial exploratory models we evaluated the conditional association between measures of sex and each outcome with the expectation that early sex (initiation at under 16.5 years of age) rather than on-time sex would be associated with adverse outcomes. We also hypothesized that girls would be more likely to experience adverse outcomes associated with sex than would boys in general (indicated by the magnitude and sign

of the female by sex interaction) and that this would be particularly true for girls who had sex early (the female by age at first sex interaction).

Beyond these global norms pertaining to gender and timing, we also hypothesize that school normative contexts shape the conditional association between sex and the academic, behavioral and psychological outcomes we evaluate. To test for the possibly varied effects of schools on student outcomes we estimate models in which the intercept (conditional school mean) and slope for sex are free to vary across schools. We also evaluate the degree to which gender difference in the conditional association between sex and different outcomes vary across schools by freeing the gender interaction terms.

Preliminary Results

Grades

Our findings with respect to grades are shown in Table 1. Here we see that students who had sex prior to wave 1 and who were under the mean age for first sex reported average grades that were about a fifth of a grade point lower (b=-0.22) than otherwise similar teens who were virgins net of race/ethnicity and parental education (controls not shown). Those who first had sex at or over the mean age for first sex, however, had average grades that were lower than virgins, but by a much smaller margin (-0.074 = -0.220+0.144) that does not attain statistical significance. Consistent with our hypothesis, then, the students who violated age-specific norms regarding sex had lower GPAs than virgins, but the difference in GPA for those reporting on-time sex and virgins was modest and non-significant. Evidence for a gender interaction with the timing of sex was weak for the grades outcome.

Turning to school effects, we see that average grades vary significantly across school conditional on student demographic characteristics and sexual history. The conditional average school grades have a standard deviation of 0.17 grade points. This likely reflects variation in average student effort, ability and course taking as well teacher ability and grading standards. The association between having had sex, and having first had sex prior to age 16.5, with average grades also varies across school contexts, with standard deviations of 0.08 and 0.10, respectively. This variation is consistent with our hypothesis that norms about sexual behavior vary across school and that that variation induces variation in the conditional association between (the timing of) sex and academic achievement.

Attitudes toward sex, at both the student and school levels, improve the fit of the model, reducing BIC by 17 points, and mediate about a third of the average conditional association between having had sex prior to wave 1 and grades. The more permissive the attitude of individual students (-0.10) and the average student at the school they attend (-0.28), the lower the expected average grades of each respondent. Standard deviations of the two attitude measures are 0.60 and 0.18, so the x-standardized coefficients are -0.06 and -0.05, respectively. Finally, the share of students at the school who claim to have engaged in sex is positively related to grades, but conditioning on the share of students who have engaged in sex (mean 0.37, sd 0.14) increases the magnitude of the negative relationship between permissive attitudes toward sex at the school level and average grades. Perhaps permissive attitudes without experience pose more of a distraction for students than the actual experience of having sex. This nuanced finding merits further exploration as we develop the paper. However, the

inclusion of the share of students engaging in sex does not significantly improve model fit by BIC; it is on the border of significant based on deviance.

School problems

Table 2 shows our findings regarding school problems. Net of other demographic characteristics, students who have engaged in sex prior to wave 1 report levels of school problems that are 0.14 points (about a fifth of a standard deviation) higher than those reported by virgins. The timing of sexual debut does not seem to matter for boys (the main effect is non-significant at 0.04) but does for girls, such that girls who first engage in sex 'on time' are not statistically or substantively distinguishable from girls who are virgins with regard to school problems. On the other hand, girls who initiate sex early report greater average levels of school problem than girls who abstain from sex (but the same average level of school problems as boys who are virgins). These results may reflect gendered norms about both social behavior and sex. Boys are more prone to conflicts in school with teacher and peers, as indicated by the -0.17 main effect of female in Table 2. However, boys who engage in sex may be especially prone to such problems. Perhaps they are engaged in a precocious transition to adulthood, whereby some boys seek to emulate an image of masculinity associated with both sexual prowess and anti-authority behavior (similar to the lads in Willis, 1977). This is clearly not the case for girls.

The main effect of having had sex varies across schools almost as much as the conditional school mean for school problems, with a standard deviation of 0.08. In results not shown we found no evidence of variation across schools in the conditional effect of timing of first sex for either boys or girls. Student, but not school mean attitudes, are also associated with school problems; school problems increase by about 0.08 for each standard deviation increase in the permissiveness of student attitudes toward sex. Attitudes mediate about a third of the conditional association between the main effect of sex and incidence of school problems. In the final model we see that, while average school *attitudes* about sex do not seem to matter much for school problems, the *share of students who report engaging in sex* does matter: the higher the share of sexually active students, the lower the average reports of school problems. The fully standardized coefficient is not large, at 0.06, but the findings is theoretically counterintuitive and merits further exploration.

Depression

Table 3 shows results for depressive symptoms. Those who have engaged in sex are about 17% of a standard deviation (0.08 points) more depressed on average than virgins net of demographic characteristics. The main effect of sex for girls is about 60% greater in magnitude than it is for boys. On the other hand, girls who have sex on time (at 16.5 years of age or later) do not really experience any depressive association with sex, while boys do. The fact that early sex is more consequential for girls is consistent with our hypothesis that norms about sex are more strongly enforced for girls than boys. However, the negative effects of sex for boys who initiate sex on time is inconsistent with our hypothesis about gendered norms for sex; we will explore this further as we develop the paper.

Looking across schools, we find schools vary in the conditional average level of depression reported by their students. The standard deviation of the mean across schools is

0.04. We find no evidence of cross-school variation in the conditional association between engaging in sex and depression for boys but we find appreciable variation for girls. This is consistent with the notion that school norms for sex for girls vary more consistently than they do for boys. More permissive average school attitudes toward sex are associated with slightly higher average levels student depression but the share of students claiming to actually have engaged in sex appears to be independent of average levels of depression at the school.

Conclusion & Discussion

In these preliminary analyses, we test the associations between adolescent sex and educational and mental health outcomes by age, gender and school. We argue that variation in conditional associations with sex and various outcomes across these dimensions reflect variation in the impact of different types of norms. For **global norms**, we look to gender and timing to determine if associations differed for girls and those who had sex early relative to the mean age at first sex. We find that sex is negatively associated with grades if it happens 'early' and positively associated with school problems for girls (only) if it is 'early.' For these educational outcomes, gender, alone, does not seem to shape associations with sex. For depression, however, we found a positive association with sex only for girls (girls who had sex were more depressed). This association was even larger for girls who had sex early.

These findings are consistent with the idea that global norms by gender and with regard to the timing of sex are at work in shaping the outcomes of sex for adolescents. Our findings confirm that early sex is generally detrimental to academic engagement and mental health, and these timing findings hold more often for girls than boys. Why might violating sex norms be more consequential for girls than boys? We suggest two possible reasons. First, social psychological research on gender in adolescents documents that girls are more relationally oriented (e.g. Rudolph 2002), and sexual intimacy is at least physically and usually emotionally relational. Second, the risks of physical effects of sex (pregnancy and STIs) disproportionately accrue to girls. This heightened threat may further induce psychological and social effects for girls.

With regard to **local norms**, we test the school-level variation in the association between having sex and average outcomes across contexts. Here we find that there is substantial variability across schools, suggesting that, indeed, schools represent different social contexts to which their students are exposed. Further, we test how school-level attitudes towards sex and the proportion of teens who have had sex in a school shapes school-level grades, school problems, and depression. Here we find that school level sex attitudes *and* behaviors are linked to school-level grades, school-level sex behaviors are linked to school-level problem behaviors and school-level sex attitudes are linked to school-level depression for girls. That sometimes school-level attitudes are linked to depression while school-level behaviors are linked to problem behaviors might be attributable to differences in the phenomena being measured. Attitudes and depression are both affective or internalized conditions that may tend to vary together whereas having sex and school problems are both behavioral or externalizing conditions that may tend to vary together. Tapping both sex attitudes and behaviors at the individual and school levels allows us to assess outcomes across the internalizing/externalizing divide.

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Table 1: Grades Regressed on Sex, Timing, and Attitudes

	OLS with Interactions	OLS Baseline	Baseline Random Effects	School-Level Attitudes	School-Level Sex
Female	0.220***	0.232***			
	(0.022)	(0.018)			
Had any sex w1	-0.220***	-0.194***	-0.170***	-0.126***	-0.128***
	(0.029)	(0.021)	(0.024)	(0.025)	(0.025)
female*any sex	0.054				
	(0.041)				
Sexual debut >=16.5yrs	0.144**	0.100**	0.082*	0.076*	0.078*
	(0.057)	(0.043)	(0.045)	(0.046)	(0.046)
female*sex>=16.5yrs	-0.097				
	(0.084)				
Attitudes Toward Sex W1				-0.103***	-0.102***
				(0.018)	(0.018)
School: attitudes toward sex w1				-0.281***	-0.405***
				(0.108)	(0.128)
School: any sex w1					0.319*
					(0.168)
Constant	2.065***	2.063***	2.035***	1.993***	1.907***
	(0.169)	(0.169)	(0.168)	(0.167)	(0.174)
Observations	6,179	6,179	6,179	6,179	6,179
R-squared	0.111	0.111			
BIC	13369	13354	13227	13210	13216
Deviance	13238	13240	13079	13044	13042
Number of groups			126	126	126
sch std dev			0.174	0.159	0.162
b(anysex) std dev			0.0836	0.0844	0.0837
b(sex>16.5) std dev			0.103	0.111	0.112
student std dev			0.685	0.683	0.683

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

Table 2: School Problems Regressed on Sex, Timing, and Attitudes

	OLS with Interactions	OLS Baseline	Baseline Random Effects	School-Level Attitudes	School-Level Sex
Female	-0.168***	-0.174***	-0.174***	-0.106***	-0.105***
	(0.020)	(0.017)	(0.017)	(0.019)	(0.019)
Had any sex w1	0.144***	0.134***	0.129***	0.080***	0.084***
	(0.027)	(0.019)	(0.023)	(0.023)	(0.023)
Sexual debut >=16.5yrs	0.039	0.045	0.035	0.045	0.042
	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)
female*sex>=16.5yrs	-0.150*	-0.164**	-0.150**	-0.165**	-0.165**
	(0.078)	(0.073)	(0.073)	(0.073)	(0.073)
Attitudes Toward Sex W1				0.130***	0.129***
				(0.017)	(0.017)
School: attitudes toward sex w1				-0.060	0.072
				(0.079)	(0.093)
female*any sex	-0.020				
	(0.038)				
School: any sex w1					-0.314***
					(0.122)
Constant	2.375***	2.377***	2.328***	2.360***	2.438***
	(0.156)	(0.156)	(0.157)	(0.157)	(0.159)
Observations	6,275	6,275	6,275	6,275	6,275
R-squared	0.048	0.048			
BIC	12764	12752	12820	12787	12792
Deviance	12633	12638			
Number of groups			128	128	128
sch std dev			0.0900	0.0874	0.0827
b(anysex) std dev			0.0838	0.0819	0.0742
student std dev			0.656	0.653	0.653

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

Table 3: Depression Regressed on Sex, Timing, and Attitudes

	OLS with Interactions	OLS Baseline	Baseline Random Effects	School-Level Attitudes	School-Level Sex
Female	0.127***	0.137***	0.137***	0.135***	0.136***
	(0.010)	(0.015)	(0.015)	(0.015)	(0.015)
Had any sex w1	0.081***	0.041**	0.041**	0.040**	0.041**
	(0.015)	(0.017)	(0.017)	(0.017)	(0.017)
female*any sex	0.053**	0.046*	0.046*	0.046*	0.046*
	(0.021)	(0.027)	(0.027)	(0.027)	(0.027)
Sexual debut >=16.5yrs	-0.027	-0.003	-0.003	-0.002	-0.002
	(0.031)	(0.032)	(0.032)	(0.032)	(0.032)
female*sex>=16.5yrs	-0.159***	-0.147***	-0.147***	-0.147***	-0.147***
	(0.046)	(0.047)	(0.047)	(0.047)	(0.047)
School: attitudes toward sex w1				0.082*	0.093*
				(0.046)	(0.056)
School: any sex w1					-0.024
					(0.072)
Constant	0.179***	0.399***	0.399***	0.401***	0.406***
	(0.047)	(0.096)	(0.096)	(0.096)	(0.098)
Observations	10,779	7,024	7,024	7,024	7,024
R-squared	0.066				
BIC	13404	9001	8992	9002	9014
Deviance	13265	8824	8824	8825	8828
Number of groups		128	128	128	128
sch std dev		0.0419	0.0419	0.0403	0.0410
b(anysex) std dev		4.96e-07			
b(female*anysex) std dev		0.0828	0.0827	0.0830	0.0829
student std dev		0.449	0.449	0.449	0.449

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