Adolescent Sex and Well-Being: Are Local Norms Important?

Ann Meier (meierann@umn.edu)
Department of Sociology &
Minnesota Population Center
University of Minnesota
Minneapolis, MN

Eric Grodsky (egrodsky@ssc.wisc.edu)
Department of Sociolgy &
Center for Demography & Ecology
University of Wisconsin
Madison, WI

Bill McCarthy (bdmccarthy@ucdavis.edu
Department of Sociology
University of California-Davis
Davis, CA

ABSTRACT

A growing literature links adolescent sex to non-physical outcomes including depression, disinterest in education and delinquency. Recent evidence suggests that the relationship context in which sex occurs contributes to its consequences. Using multi-level models and the Add Health data, we broaden the scope of relevant others beyond relationship partners to ask if local sex norms among friends, classmates or schoolmates condition the links between sex and adolescent mental health, delinquency, or academic performance. On the one hand, such a relationship is expected, as norms are especially salient and powerful in adolescence as identities and reputations are developing. On the other hand, sex is largely a private matter. With the ability to avoid sanctions by nondisclosure, teens may internalize sex norms less than most other norms leaving them unimportant in shaping the consequences of sex. Our preliminary findings are consistent with this latter explanation.

**Paper prepared for submission to the 2014 Population Association of America Annual Meetings.*

INTRODUCTION

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). While the mechanisms underlying these associations remain ambiguous, recent evidence suggests that the context in which sex occurs contributes to its negative consequences. Several studies document how the relationship context of adolescent sex moderates its consequences for adolescent well-being (McCarthy & Casey 2008; McCarthy & Grodsky 2011; Meier 2007).

This study extends prior investigations and focuses on a set of moderators for which little previous research exists: the behavior and attitudes of friends and schoolmates and the *normative context* that these create. We ask whether the normative context of sex is a key determinant of the social and psychological consequences associated with adolescent sex. Our focus is on local norms that contribute to the normative context of sex—norms that characterize immediate social settings. In adolescence, the attitudes and behaviors of friends and peers are important sources for local norms, particularly for sex (Cavanagh 2007). Friends and peers communicate local norms and their corresponding sanctions; they punish norm violations and reinforce the internal sanctioning expected of norm violators. On the other hand, sex is among the most private of all behaviors, perhaps protecting norm violations from sanctions (because violations are not know). This may make sex norms less salient than norms about other more visible behaviors.

Our study examines whether or not the norms that characterize the social world of adolescents moderate the relationship between their emergent sexual behavior and well-being. We examine normative context at two levels, situating adolescents in smaller friendship and course-taking groups, as well as within schools. Coupled with existing knowledge about sex and physical health, this study contributes to our understanding of the effects of teen sex on well-being across domains of mental health, educational engagement, and risky activities. Our focus on normative context highlights a potentially important milieu for promoting adolescent well-being that is rarely discussed in studies of teen sex or in policy circles.

BACKGROUND

Adolescence is a period of intense social and emotional development during which young people shift attachment from parents to peers and romantic partners, further develop their individual identity, and make choices that have immediate and long term consequences for education, work, and health trajectories. The initiation of intimate, and sometimes sexual,

relationships is an integral part of adolescent social development (Brooks-Gunn & Furstenberg 1989). About half of all 15-19 year olds in the U.S. have had sex at least once: 7% of youth report sex before age 13, while 33% of 9th graders and 65% of 12th graders report having had sex (CDC 2008). Teenage males are slightly more likely than females to have had sex—50 versus 46%, respectively (CDC 2008). Rates of teen pregnancy and childbearing remain high in the U.S (e.g., the U.S. adolescent fertility rate is third highest in the OECD Family Database, 2005). Countries often considered peer nations (e.g., Canada, the Netherlands) have similar rates of teen sexual activity but substantially lower rates of teen pregnancy, childbearing, and abortion (Guttmacher Institute 2002).

Adolescent sex has obvious consequences for physical health, but as a new domain of emotional and social activity, sex may negatively affect other dimensions of well-being, particularly when it is a source of stress and strain (Meier 2007). The negative consequences of sex may be shaped by the extent to which sex is normative. One might posit that it is not the physical act of intercourse that leads adolescents to become depressed, engage in risky behaviors or stop attending classes; it may be the relational or the broader social meaning of the act that determines the magnitude of the adverse effects of sex, if any, on adolescent well-being. Following Hechter and Opp's admonition (2001:406), "if researchers do not analyze the conditionality of a norm, it is unclear just what they are explaining," we argue that the meaning and consequences of adolescent sex may be in part products of local sexual norms.

Adolescent Sex and Three Dimensions of Well-being

Researchers have begun to identify the emotional, social, and behavioral correlates of adolescent sexual activity. Only a few studies, however, consider the role of the normative context of sex in shaping mental health, academic engagement, and risky behaviors in adolescence and into adulthood. These studies assess global norms, or those that are thought to operate throughout American society, not those that are empirically identified among a group of relevant, proximate others.

Adolescent Sex and Mental Health. Consensual sexual activity typically begins in adolescence and most research finds a positive correlation between teen sex and depressive symptoms (Hallfors et al. 2005; Rector et al. 2003;). 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. Other research tells a more nuanced story about how norms shape the degree to which 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 not emotionally close and short-lived (e.g. a "hook-up") is not normative, increases depression, and reduces self-esteem, especially for girls (see too England, Fitzgibbons Shafer, and Fogarty 2008). 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 norms by having sex "on-time," with a romantic partner, and/or in a committed relationship.

Adolescent Sex and Academic Engagement. 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 recent study, McCarthy and Grodsky (2011) argue that global norms about the relationship context of teen sex shape the effects sex has on education. They distinguish among four types of youth: those who abstain from sex; those who have sex only in romantic relationships (conforming to norms); those who have sex only in more casual relationships; and those who engage in sex in both types of relationships. Examining eight measures of educational engagement, they find that girls and boys who have sex in casual 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.

Adolescent Sex and Other Risky Behaviors. Most research reports high correlations between sexual activity and illegal substance use, violence, and other criminal behaviors (e.g., Armour & Haynie 2007; Elliott & Morse. 1989). Many researchers suggest that these activities are comorbid manifestations of a preference for unhealthy risk taking (e.g., Jessor & Jessor 1977). Yet, this research ignores the relationship context of sex. Sex differs from most types of substance use, violence, and crime in that the contexts in which sexual behavior is deviant are much more limited and highly age graded: sex is a normal, even fundamental, dimension of maturation, while illegal substance use, violence and crime are not. Moreover, sex is typically more private than other risk behaviors, and thus potentially unknown to friends and schoolmates. Indeed, more recent research finds that sexual intercourse in romantic relationships is not significantly related to substance use or involvement in crime; these activities significantly increase with sexual intercourse only when it occurs in non-romantic relationships (McCarthy & Casey 2008). In sum, we have some evidence indicating that the romantic relationship context of sex conditions the effect it may have on mental health, school problems and delinquency. But, we know little about whether norms that characterize the larger social world of adolescents similarly shape the effects of sex for teens.

Normative Context

Researchers and laypeople generally agree that children are harmed by engaging in sex; the younger the child, the greater the harm. However, few people believe that consensual sex among mature and romantically involved adults increases their risk of depression, drug addiction, or involvement in other dangerous activities, or reduces their academic or labor force productivity (independent of the effects of other relationship attributes such as emotions; see Schwartz 2006). Biological changes in adolescence increase sexual interest and desire, and it is in this life stage that most people learn how to form and maintain relationships with romantic partners, including how to incorporate physical intimacy into those relationships (Moore & Rosenthal 2006). Somewhere in the years between childhood and adulthood the norms governing sexual activity shift.

There is a voluminous and multi-disciplinary literature on the emergence, maintenance, and power of norms (Coleman 1990; Hechter & Opp 2001). Here we briefly summarize key points of our orientation toward the norm-behavior link. We assume that local norms about adolescent

sex originate mostly through informal means (Opp 2002); although laws about age of consent exist, for example, most of these norms arise more informally. People are particularly influenced by the actions and attitudes of those whom they value the most (Ajzen & Fishbein 1980; Coleman 1990; Sherif 1936), and adolescents place a premium on peer acceptance (Brown & Klute 2003). Individual conformity to a perceived norm increases when consequences for norm violation are more costly or the personal utility (pleasure, subgroup status, etc.) of violating a norm is less than the social costs of doing so (Coleman 1990; Elster 1989; Hechter 1987; Homans 1958). Important social rewards for normative behavior include group approval, acceptance and status; key social costs include rejection, exclusion, ostracism, and stigma. These benefits and sanctions are arguably most salient in adolescence when identities are vulnerable and developing (Marcia 1983). Thus, norms are particularly salient in adolescence, and adolescents turn to their peers to provide guidance on the content of norms and the consequences of violations.

Local Norms. The effect that sex has on well-being may be conditioned by local contexts in which adolescents live day to day. Although teens' decisions about sex are influenced by parents (Fingerson 2005) their friends are increasingly important for framing acceptable sexual behavior over the years of adolescence and young adulthood. Youth vary in their views about sex: some strongly support abstinence until marriage, whereas others view sex during adolescence as normative (Bearman & Brückner 2001; Carlson 2005). Adolescents must negotiate these contradictions and many rely on friends to provide guidance on local norms (Rodgers 1996). Ethnographic research documents the influence of friends' expectations and behaviors on teens' decisions about sex (Anderson 1999; Thompson 1995; Tolman 2002), as does research using nationally representative data. In an analysis of data from the Adolescent Health study Cavanagh (2007:594) finds that teens rely on their peers for learning the "the ins and outs of romantic life": 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 (also see Diiorio et al. 1999). What we do not know, however, if these normative influences extend to shape the consequences of sex for youth. Because sex is often very private, it is possible for youth to engage in the behavior with minimal threat of sanction; their peer groups may not know.

Beyond the immediate context provided by one's friends, adolescents may also be responsive to the normative context of school. 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 observation may pertain to norms about sexual behavior as much as they do to those for other activities. Schools provide adolescents with opportunities to observe and hear about the behaviors and beliefs of peers with whom they do not have direct or close relationships. Youth in this "wider circle" of peers (Giordano 1995) may be as important as close friends in governing and sanctioning behavior: they may be less forgiving of normative transgressions; they may have greater social status and power than one's current friends; and they may be highly desired "potential" future friends or

intimates. As a result, schoolmates may represent important sources of the "generalized other" that, according to Mead (1932), people construct as a summary of normative expectations.

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. We anticipate that the effects of school norms on the consequences of sexual activity for well-being, if they exist, are separable from the consequences of friendship norms. Indeed, the school norms may trump friendship norms if school norms reflect a broad consensus among students attending the school (i.e., low between-student variance). 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 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." Our paper extends the work of Bearman and colleagues by modeling multiple layers of norms operating to influence adolescent decisions and by examining norms about sexual activity (v. pledging or dating).

In summary, this paper investigates the influence of sex on adolescent well-being with attention to layers of normative context including the influence of friends' and schoolmates' sex-related attitudes and behaviors that may condition the effect of sex on adolescent well-being. A good deal of theory and empirical evidence suggests that norms especially salient in adolescence, yet we do not know if they govern or condition sexual behavior, arguably the most private behavior in which adolescents may engage.

DATA, MEASURES, METHOD

Using the National Longitudinal Study of Adolescent Health (Add Health) we estimate a series of generalized hierarchical models to evaluate the power of local contexts to shape the impact of sex on adolescent outcomes in which an individual is subject to the contexts created by several smaller peer groups that are, in turn, nested in the school she or he attends.

Data. 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. One feeder school for each of 56 high schools was selected with a probability proportionate to the number of students they typically send to the high school. High schools that included grades 7 and 8 were not matched to an external feeder school, nor were four high schools with very large numbers of feeder schools. The final sample included 132 high schools and middle schools from the original 80 strata (Bearman et al. 1997). The sample is stratified by region, urbanicity, school sector (public/private), school ethnic composition, and size. More than 70 percent of the schools

contacted agreed to participate with approximately 90,000 students completing a self-administered in-school questionnaire in 1994-5.

In 1995, the study surveyed a random subset of 20,745 students and their parents in their homes. Among other things, students in the in-home survey were asked a series of questions on which we rely to measure their normative beliefs about sex. Approximately 200 students were recruited from each high school/feeder pair, regardless of size (about 17 students per grade). About 3,700 of these youth are part of a '*saturated sample'* of 16 schools (two large, 14 smaller) in which all students were recruited to participate in the in-home survey. These schools were purposely chosen to introduce variation in population and ethnicity. In 1996, over 85% of all eligible wave 1 respondents participated in wave 2 (graduating seniors were not re-interviewed).

Our analytic sample is smaller than the full in-home sample for several reasons. First, we eliminate students who were not part of the probability sample (n=1,823). Only respondents 15 years of age and older were asked key questions about their normative beliefs about the appropriateness of engaging in sexual intercourse, so we omit those under 15 years of age (n=4,958). We also exclude those who indicate that they have been either the perpetrator or victim of a rape (n=648) as the experiences of these youth will be qualitatively different from those of typical respondents. Perhaps most consequential for the size of our analytic sample, we omit students who have no nominated friends who participated in the in-home survey. Students were asked by Add Health to enumerate up to ten friends (five male and five female), and most (94%) nominated at least one. We eliminate students who either nominated no friends or nominated no friends who participated in the in-school survey (n=3,686). This leaves us with an analytic sample of 9,632 students, many of whom have missing data on certain items, including about 5,000 who have no friends who participated in the in-home survey.

Our initial analysis described below relies primarily on items from the respondent and parent interviews from wave 1. Future analyses will bring in later waves to attend to the selection factors that threaten causal inference and to assess longer-term effects of sex and the durability of adolescent norms in conditioning these effects. For a few measures, we also draw on data on course taking collected as part of the Adolescent Health Academic Achievement Study (AHAA) described elsewhere (Frank et al. 2008).

Ultimately, we are interested in the effects of adolescent sex on well-being across a range of domains from mental health to risky behaviors and academic achievement. As detailed above, we ask whether effects of sex on these outcomes are heterogenous across different local normative contexts in which teens behave and are judged by others.

Adolescent Sex Measure

We use a measure of whether or not respondents *had sex* by the time of the initial survey. We extract this measure from a series of questions respondents answered about their interactions with up to three people with whom they have had a "special romantic relationship" over the 18 months leading up to the survey. If they report no romantic relationships over the past 18 months, they are asked whether they have held hands, kissed on the mouth, and told they liked or loved any other person (i.e., liked' relationships). For each person listed as a romantic or liked partner, respondents were given a set of cards with behaviors written on them (e.g., "I met

my partners parents" and "We held hands") and asked to remove the cards that describe things that have not happened with each potential partner. Among those cards was, "We had sexual intercourse." We coded respondents who retained that card for at least one partner as having had sexual intercourse (all other respondents are coded as never having had sexual intercourse).

Well-Being Outcome Measures

We use an eleven-item version of the CES-D scale to assess *depressive symptoms*. These items ask students to report how often they experienced each of the following over the week before the survey: (bothered by things that usually don't bother you; could not shake the blues, even with help from family and friends; felt that you were just as good as other people; had trouble keeping your mind on what you were doing; felt depressed; felt that you were too tired to do things; enjoyed life; felt sad; and felt that people disliked you. Ordinal responses were never or rarely (0), sometimes (1), a lot of the time (2) or most or all of the time (3). We average response on the items for a composite measure with a range of 0 to 3.

We examine three indicators of high-school educational engagement**.** *School Problems* and *School Attachment* are scale measures based on responses to statements that ranged from strongly agree to strongly disagree. The former measures the frequency of getting along with teachers, paying attention, completing homework, and getting along with other students; the latter reflects respondents' agreement about teacher fairness, being happy when at school, feeling close to people at school, feeling a part of the school, and feeling safe at school. Our third measure is the student's self-reported *GPA* in the last year.

To assess *delinquency,* we generate an index based on self-reports of participation in 14 delinquent activities in the past 12 months. These included painting graffiti, damaging property, shoplifting, stealing something worth less than $50, stealing something worth $50 or more, burglarizing, using a car without the owner's permission, selling drugs, getting into a serious physical fight, seriously injuring another person, threatening to use a weapon on someone, getting into a group fight, pulling a knife or gun on someone, or shooting or stabbing some- one. We counted the number of delinquent activities from 0 to 14.

Normative Contexts

To measure local norms, we aggregate the sex attitudes and behaviors of three groups of proximate others: friends, classmates, and schoolmates. Friends are those nominated by the respondent who also took part in the Add Health wave one in-home interview. Although close to one-half of friendship nominations were not reciprocated (Vaquera & Kao 2008), a respondent's listing of a person as a friend is suggestive of the importance of the listed person. Classmates are those who are taking some of the same courses as the respondent and who also took pare in the Add Health wave one in-home interview. Classmate groups are based on Frank et al.'s (2008) network analytic techniques with the AHAA data that account for the curricular structure of the school and the courses students take in that school. These groups reflect an 'intermediate social structure' between the school community and the friendship group (Field et al. 2006; Frank et al. 2008). School groups are comprised of all other respondents in the same school who also took part in the Add Health wave one in-home interview

In addition to the questions about whether the respondent had sex described immediately above, respondents ages 15 and older provided information on their sex-related attitudes. We use sex attitudes as an indicator of stated norms about sex and sexual behavior as an indicator of enacted norms about sex. Together, stated and enacted norms should give a fairly comprehensive account of what is said and done about sex in the local context. The sex attitude questions ask how strongly respondents agree with the following statements about the consequences of their having sex: friends would respect you more; partner would lose respect for you; you would feel guilty; it would upset your mother; it would give you great pleasure; it would relax you; it would make you more attractive to opposite sex; and you would feel less lonely. Because some respondents' friends, classmates, and schoolmates are also respondents themselves, we are able to use their sex attitude and behavior responses to create friend and school normative context measures.

To characterize the *schoolmate and classmate normative context* vis-à-vis sexual activity, we categorized each groups aggregated sex attitudes and behavior by whether they were much below, near to, or much above the sample's overall mean sex attitudes and behavior. We operationalized group sex attitudes as 'more liberal' if they were at or more than 0.5 of a standard deviation below the mean sex attitudes; we coded them 'average' if they were between 0.5 standard deviations below and 0.5 standard deviations above the mean; and we coded them 'more conservative' if they were at or more than 0.5 standard deviations above the mean. We operationalized aggregate sexual behavior at the classmate and school mate levels as conservative if less than 25% of the group reported having sex; average if between 25 and 45% of the group reported having sex; and liberal if more than 45% of the group reported sexual activity.

To assess *friendship group* normative context, we use data from respondents asking them to identify up to five friends of each gender. Friend measures are based on wave one in-home responses from nominated friends who were identified in the data. Among those with data for at least one nominated friend, the average student reports three friends; the median number of friends on which the friends' measures are based is two. The small number of friends on whom we have data requires a different measurement strategy than that employed above for classmates and schoolmates. We average friend attitudes toward sex and code the groups' attitudes as '1' if they are more liberal than the median sex attitudes and '0' if the friendship group falls below the median. Likewise, we code friendship groups' sexual behavior as '1' if anyone in the group has had sex and '0' if no one in the group has.

Controls

As noted earlier, we recognize more global (societal) norms that dictate that girls and younger adolescents abstain from sex. While not the focus of this study, we include gender and age as controls. *Gender* is straightforward with an indicator for male/female. To assess *age*, we use the respondents' date of birth to divide youth into groups based roughly on the mean age of first sex for this cohort (16.5): sixteen and under, and older than sixteen.

In addition, we include controls for parents' attitudes about their child having sex, parental education, family income, and respondent's race. While we focus on non-familial local normative contexts, we recognize that families are also influential in shaping teens' decisions regarding

sex and, potentially, its consequences (Fingerson 2005). We gauge parents' attitudes with a question that asks parents to indicate how strongly they agree or disagree with the following statement, "You disapprove of (your daughter/son) having sexual intercourse at this time in (his/her) life." Response options range from "strongly agree" to "strongly disagree" on a five-point Likert scale. We use the middle category of "neither agree nor disagree" as the reference category making "agree or strongly agree" the expression of the most conservative sex norms and "disagree or strongly disagree" the expression of the most liberal norms. Parental education uses the resident parent with the highest attainment or the only resident parent in the case of single-parent families. It is coded in four categories: less than high school, high school graduate or GED, some college, college graduate or more. Family income comes from the parent interview and is coded in quintiles. Finally, race is represented by five categories: white, black, Hispanic, Native American, Asian, and other.

Methods

We estimate two-level random effects models to reflect accurately the ideas we described earlier. In future analyses, we will test friendship groups as an explicit level in the model (rather than including friendship network covariates at the student level). We anticipate needing to use (only) the saturated sample to have enough friends in each respondents network represented in the data.

While the functional form of the models we estimate varies across our five outcomes, the basic structural equations do not.

Let y_{ij} represent outcome y for person *i* in school *j* measured at wave 1. At the individual level:

$$y_{ij} = \beta_{0j} + \beta_{1j}(had\ sex) + \eta(controls) + e_{ij} \qquad (1)$$

In Equation 1, β_{0j} captures the main school effect, the expected difference in the outcome y for students attending school *j* relative to the average across schools for students who have not had sex and have values of 0 for the vector of control variables. β_{1j} estimates the conditional association between engaging in sex and the outcome y for students attending school *j*. Finally, e_{ij} is a randomly varying disturbance accounting for unmeasured characteristics that affect the outcome for student *i* in school *j*, assumed to be independent of other predictors.

We assume that the effect of schools on both conditional outcomes (β_{0j}) and the conditional association between engaging in sex and outcomes (β_{1j}) is a function of school normative contexts. We allow the intercept to vary randomly among schools:

$$\beta_{0j} = \gamma_{00} + \boldsymbol{\delta}_0\boldsymbol{\omega} + u_{0j} \qquad (2)$$

where $\boldsymbol{\sigma_0}$ is a coefficient vector capturing the association between school-level predictors measures by vector **ω** (mean stated and enacted norms). γ_{00} estimates the mean of school means on y for students who have not had sex, have 0s on all the student-level controls (in eq. 1) and 0 on all the school level predictors **ω.**

In contrast to the intercept, we assume the slope coefficient β_{1j} varies nonrandomly across schools explicitly as a function of the vector of normative climate measure (**ω**):

$$\beta_{1j} = \gamma_{10} + \boldsymbol{\delta}_1\boldsymbol{\omega} \quad (3)$$

This amounts to adding individual-level interactions between the normative climate measures included in **ω** and the indicator of whether or not a student has had sex. We constrain the slope coefficient because we lack sufficient power to get precise estimates of random variation in the conditional association between engaging in sex and outcomes across schools.

In addition to modeling school-level variation in both conditional means in outcomes and the conditional association between sex and each outcome, we also explore within-school variation in conditional outcomes as a function of norms held by friends and classmates. Although both friend groups (as measured in Add Health) and classmates are nested within schools, limited numbers of both groups within schools and their overlapping memberships (alters and egos appearing in multiple friend groups, for example) preclude modeling them as an additional level of analysis. Instead, we include attributes of both classmates and friends at the individual (within-school) level both as main effects and interactions with had sex. For example, our model of the influence of friend norms on outcome y_{ij} is:

$$y_{ij} = \beta_{0j} + \beta_{1j}(had\ sex) + \beta_2(had\ sex * friend\ norms) + \lambda(friend\ norms) + \eta(controls) + e_{ij} \quad (4)$$

Note that, while the main effect of having sex is subscripted for schools, the interaction of sex and friend group norms is not. We do not allow the influence of friend group norms to vary across schools. While it is conceivable that friend and school level norms interact in interesting ways to shape the conditional influence of sex on adolescent outcomes, our data lack the power to offer a useful test for such a proposition.

Preliminary Findings

Table 1 shows descriptive statistics for all measures included in our preliminary analysis.
In Tables 2 and 3 we show key coefficients from our multivariate models. In Table 2 we show predicted relationships between each of the outcomes—depression, delinquency, school attachment, school problems, and GPA—and whether the respondent had sex in different local contexts: where friends hold more conservative sex attitudes (v. more liberal), where classmates hold more liberal or more conservative (v. average) sex attitudes, and where schoolmates hold more liberal or conservative (v. average) sex attitudes. For each outcome, the main effect of having sex is significant and in the expected direction: having sex is positively associated with depression, delinquency, and school problems; it is negatively associated with school attachment and GPA. We do not find any differential effects based on the local context when assessed by friend, classmate, or school level stated norms about sex.

<Table 1 here>

Table 3 repeats the exercise, but instead conditions the effect of sex on the enacted norms of each local group—that is, if more or fewer friends, classmates, and schoolmates also reported having sex. To reiterate, the main effect of having sex remains associated with the five well-being outcomes as we expect. Again, however, we do not find any conditional effects of the

local context when assessed by friend, classmate, or school level prevalence of reported sexual behavior in the group.

<Table 2 here>

In summary, our preliminary findings indicate that sex is related to well-being across a range of domains from mental health to delinquency and schooling outcomes. However, we found little heterogeneity in these effects by the sex norms of important others including proximate groups of self-nominated friends and more distal groups representing those who attend the same school. Given the established importance of the group for adolescence, in particular (Barrett et al., 2007; Cavanaugh 2007; Coleman 1961), these null findings may come as a surprise. However, our results consistent with the idea that sex is different from other behaviors for which norms exist and on which teens may be judged or sanctioned—it is less visible (e.g. than dress) and involves fewer others (e.g. than extracurriculars).

In an attempt to delve deeper, prior to the PAA, we will explore several other avenues that we hope will enrich our understanding of the normative environment and its potential influences on how sex affects subsequent well-being. First, a rich literature documents the importance of the friendship group, but our data on this is quite thin. For many respondents, only one nominated friend was also in the Add Health in-home interview. For a substantial minority, no such friends were part of the in-home interview sample. We will turn to the saturated sample, where all schoolmates (including all nominated friends that are from the school) will be in the data. Here we anticipate observing the normative context of larger friendship groups for each responding adolescent. An additional benefit of looking at the saturated sample is that we will also observe larger classmate and school groups. The friendship and classmate groups may be sufficiently large to treat as their own level in our analysis, rather than including their influence at the first (individual) level.

Second, we will explore other indicators of the school, classmate, and friendship group normative environment. While group-level sex attitudes and behaviors are most proximate to our individual-level behavior of sex, perhaps higher order morality norms motivate and sanction individual behavior. We will explore friendship, classmate, and school levels of religiosity (especially fundamentalism) and virginity pledging to tap such norms.

Finally, an established tradition in interpersonal relationship research suggests that the influence of groups may differ by the gender of the adolescent. Empirical work identifies different interaction styles by gender and traces these to childhood socialization (e.g., Gilligan 1982). Girls more easily maintain interactions with one or several close friends while boys interact less intimately but with larger groups of friends with a focus on competition and power (Maccoby 1990). These gender differences lead girls to develop close interpersonal relationship competencies while boys learn to how to improve their position in a wider peer group. Giordano and colleagues (2006) proffer that adolescent girls' more extensive experience with, and greater comfort in, interpersonal relationships explains the anomalous finding in their study that girls have greater confidence and influence in adolescent romantic relationships than do boys.

Regarding different sex effects across different local contexts, this research suggests that girls maybe more responsive to the norms of smaller groups of intimates, like friends, whereas boys may develop and calibrate their norms with reference to a larger and less intimate set of others, like schoolmates. Following this research, we will consider potential differences in the sensitivity of boys and girls to the norms of different groups of others.

References

Abma, Joyce C., Gladys M. Martinez, William D. Mosher, and Brittany S. Dawson. 2004. "Teenagers in the United States: Sexual Activity, Contraceptive Use, and Childbearing, 2002." National Center for Health Statistics. Vital Health Stat 23(24)

Anderson, Elijah. 1999. Code of the Street: Decency, Violence, and the Moral Life of the Inner City. New York: W. W. Norton.

Armour, Stacey and Dana L. Haynie. 2007. "Sexual Debut and Delinquency." Journal of Youth and Adolescence 36: 141-52.

Ajzen, Icek and Martin Fishbein. 1980. Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.

Barrett, Jennifer B. Jennifer Pearson, Chandra Muller and Kenneth A. Frank. 2007. "Adolescent Religiosity and School Contexts." Social Science Quarterly 88(4): 1024-1037.

Bearman, Peter S. and Hannah Brückner. 2001. "Promising the Future: Virginity Pledges and First Intercourse." American Journal of Sociology 106(4):859–912.

Bearman, Peter S., Jo Jones, and Richard J. Udry. 1997. The National Longitudinal Study of Adolescent Health: Research Design. University of North Carolina at Chapel Hill: Carolina Population Center.

Bearman, Peter S., James Moody and Katherine Stovel. 2004. "The Structure of Adolescent Romantic and Sexual networks." The American Journal of Sociology. 110(1): 44-91.

Billy, John O. G., Nancy S. Landale, William R. Grady and Denise M. Zimmerle. 1988. "Effects of Sexual Activity on Adolescent Social and Psychological Development." Social Psychology Quarterly 51 (3): 190-212.

Brooks-Gunn, Jeanne, and Frank F. Furstenberg, Jr. 1989. "Adolescent Sexual Behavior." American Psychologist 44(2):249–257.

Brown, B. Bradford and Christa Klute. 2003. "Friendships, Cliques, and Crowds." In G. R. Adams and M.D. Berzonsky (Eds.), Blackwell Handbook of Adolescence 9: 73-96.

Cairns, Robert B. and Beverley D. Cairns. 1996. Lifelines and Risks: Pathways of Youth in Our Lifetime. New York: Cambridge University Press.

Carlson, Darren K. 2005. “Teen Survey: What's the Responsible Age for Smoking, Drinking, Sex?” Gallup Poll Report August 2. http://www.gallup.com/poll/17611/Teen-Survey-Whats-Responsible-Age- Smoking-Drinking-Sex.aspx

Cavanagh, Shannon E. 2007. “The Social Construction of Romantic Relationships in Adolescence: Examining the role of Peer Networks, Gender, and Race.” Sociological Inquiry 77(4): 572-600.

Centers for Disease Control. 2008. Youth Risk Behavior Survey: Online Results. http://www.cdc.gov/HealthyYouth/yrbs/index.htm (accessed on January 21, 2010).

Coleman, James S. 1990. Foundations of Social Theory. Cambridge: Harvard University Press.

Coleman, James S. 1961. The Adolescent Society: The Social Life of the Teenager and its Impact on Education. New York: The Free Press.

Diiorio Colleen, Maureen Kelley and Marilyn Hockenberry-Eaton. 1999. “Communication about Sexual Issues: Mothers, Fathers, and Friends.” Journal of Adolescent Health 24(3):181–189.

Elliott, Delbert J. and Barbara B. Morse. 1989. “Delinquency and Drug Use as Risk Factors in Teenage Sexual Activity.” Youth and Society 21(1):32–60.

England, Paula, Emily Fitzgibbons Shafer, *and* Alison C. K. Fogarty. 2007. Hooking up and forming romantic relationships on today’s college campuses. *In* The gendered society reader, *edited by* M. Kimmel. New York: Oxford University Press. Elster, Jon. 1989. “Social Norms and Economic Theory. The Journal of Economic Perspectives, 3: 99-117.

Field, Sam, Kenneth A. Frank, Kathryn Schiller, Catherine Riegle-Crumb, and Chandra Muller. 2006. "Identifying positions from affiliation networks: Preserving the duality of people and events." Social Networks 28:97-123.

Fingerson, Laura. 2005. “Do Mothers' Opinions Matter in Teens' Sexual Activity?” Journal of Family Issues 26(7): 947-974.

Forhan, Sara E., Sami L. Gottlieb, Maya R. Sternberg, Fujie Xu, S. Seblina Datta, Geraldine M. McQuillan, Stuart M. Berman, and Laura E. Markowitz. 2009. “Prevalence of Sexually Transmitted Infections Among Female Adolescents Aged 14-19 in the United States.” Pediatrics 124: 1505-1512.

Frank, K. A., C. Muller, K. S. Schiller, C. Riegle-Crumb, A. S. Mueller, R. Crosnoe, and J. Pearson. 2008. "The social dynamics of mathematics coursetaking in high school." American Journal of Sociology 113:1645-1696.

Gilligan, Carol. 1982. In a Different Voice: Psychological Theory and Women's Development. Cambridge: Harvard University Press.

Giordano, P. C. 1995. "The wider circle of friends in adolescence." American Journal of Sociology:661-697.

Giordano, Peggy C., Monica A. Longmore, and Wendy D. Manning. 2006a. “Gender and the Meanings of Adolescent Romantic Relationships: A Focus on Boys.” American Sociological Review 71(2):260–87.

Giordano, Peggy C., Monica A. Longmore, and Wendy D. Manning. 2006b. “Hooking Up: The Relationship Contexts of ‘Nonrelationship’ Sex.” Journal of Adolescent Research 21(5):459–83.

Guttmacher Institute. 2002. Fact Sheet: Teenagers Sexual and Reproductive Health: Developed Countries. Accessed on Dec 28, 2009 at http://www.guttmacher.org/pubs/fb_teens.html.

Hallfors, Denise D., Martha W. Waller, Daniel Bauer, Carole A. Force, and Carolyn T. Halpern. 2005. “Which Comes First in Adolescence – Sex and Drugs or Depression?” American Journal of Preventive Medicine. 29 (3): 163-170.

Hechter, Michael. 1987. Principles of Group Solidarity. Berkeley: University of California Press.

Hechter, Michael and Karl-Dieter Opp. 2001. “What Have We Learnd about the Emergence of Social Norms.” In Michael Hechter and Karl-Dieter Opp (eds.), Social Norms. New York: Russell Sage Foundation, pp. 394-416.

Homans, George C. 1958. “Social Behavior as Exchange” American Journal of Sociology, 63: 597-606.

Jessor, Richard and Shirely L. Jessor. 1977. Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth. New York: Academic Press.

Longmore, Monica A., Wendy D. Manning, Peggy C. Giordano. 2004. “Adolescents’ Involvement in Non-Romantic Sexual Activity.” Social Science Research 34:384-407.

Maccoby, Eleanor. 1990. "Gender and Relationships: A Developmental Account." American Psychologist 45:513-520.

Manning, Wendy D., Peggy Giordano, and Monica A. Longmore. 2006. “Hooking Up: The Relationship Contexts of "Nonrelationship" Sex.” Journal of Adolescent Research 21(5): 459-483.

Marcia, James E. 1983. “Some directions for the investigation of ego development in early adolescence.” Journal of Early Adolescence 3: 215-223.

McCarthy, Bill and Teresa Casey. 2008. “Love, Sex and Crime: Adolescent Romantic Relationships and Offending.” American Sociological Review 73 (6):944-969.

McCarthy, Bill and Eric Grodsky. In submission. “Hooking Up in High School: Adolescent Sex and Educational Outcomes.” Revise and resubmit, Social Problems, resubmitted July 2010.

Mead, G. H. 1932. The philosophy of the present: Open Court Publishing Co.

Meier, Ann M. 2007. “Adolescent First Sex and Subsequent Mental Health.” American Journal of Sociology 112 (6): 1811–47.

Moore, Susan M. and Doreen A. Rosenthal. 2006. Sexuality in Adolescence: Current Trends. New York: Routledge.

OECD Family Database 2005. http://www.oecd.org/dataoecd/38/6/40278615.pdf

Opp, Karl-Dieter. 2002. “When do Norms Emerge by Human Design and When by the Unintended Consequences of Human Action?” Rationality and Society, 14: 131-158.

Rector, Robert E., Kirk A. Johnson, and Lauren R. Noyes. 2003 (June 2). “Sexually Active Teenagers are More Likely to Be Depressed and to Attempt Suicide.” A Report of the Heritage Center for Data Analysis (CDA03-04).

Rodgers, Joseph Lee. 1996. “Sexual Transitions in Adolescence.” Pp. 85-110 in Transitions Through Adolescence: Interpersonal Domains and Context, edited by Julia A. Graber, Jeanne Brooks-Gunn and Ann C. Petersen. Mahwah, NJ: Lawrence Erlbaum Associates.

Sabia, Joseph. 2007. “Early Adolescent Sex and Diminished School Attachment: Selection or Spillovers?” Southern Economic Journal 2007: 7491):239-268.

Schneider, Barbara L., and David Stevenson. 1999. The Ambitious Generation: America's Teenagers, Motivated but Directionless. New Haven: Yale University Press.

Schvaneveldt, Paul L., Brent C. Miller, E. Helen Berry, and Thomas R. Lee. 2001. “Academic Goals, Achievement, and Age at First Sexual Intercourse: Longitudinal, Bidirectional Influences.” Adolescence 36(144): 767-787.

Schwartz, Pepper. 2006. “What Elicits Romance, Passion, and Attachment, and How Do They Affect our Lives throughout the Life Cycle?” Pp. 49–60 in Romance and Sex in Adolescence and Emerging Adulthood, edited by A. C. Crouter and A. Booth. Mahwah, NJ: Lawrence Erlbaum Associates.

Thompson, Sharon. 1995. Going All the Way: Teenage Girls' Tales of Sex, Romance, and Pregnancy. New York: Hill and Wang.

Tolman, Deborah L. 2002. Dilemmas of Desire: Teenage Girls Talk about Sexuality. Cambridge, MA: Harvard University Press.

Vaquera, Elizabeth and Grace Kao. 2008. “Do you like me as much as I like you? Friendship reciprocity and its effects on school outcomes among adolescents.” Social Science Research 37 (1): 55–72.

Ventura, SJ, JC Abma, WD Mosher, and SK Henshaw. 2009. “Estimated Pregnancy Rates of the United States, 1990-2005: An Update.” National Vital Statistics Reports, 58(4).

Table 1: Descriptive Statistics for Analysis Variables

	Mean	Std dev	N
Outcomes			
Depression	-0.007	0.776	9630
Delinquency	1.170	1.553	9603
School Problem	-0.023	0.685	9516
School Attachment	0.022	0.684	9516
GPA	2.758	0.764	9436
Predictors			
Classmate norms			9632
Stated norms	0.013	0.995	9632
More liberal (<-0.5)	19.40%	---	
Typical (-0.5 to 0.5)	34.12%	---	9632
More conservative (>0.5)	18.80%	---	9632
Enacted norms	0.004	---	9632
<25% had sex	17.84%	---	9632
25% to 45% had sex	30.02%	---	9632
>45% had sex	24.47%	---	
Schoolmate norms			9632
Stated norms	0.000	1.000	9632
More liberal (<-0.5)	17.22%	---	9632
Typical (-0.5 to 0.5)	41.84%	---	9632
More conservative (>0.5)	13.24%	---	9632
Enacted norms*	0.404	---	
<25% had sex	10.08%	---	9632
25% to 45% had sex	50.25%	---	9632
>45% had sex	30.44%	---	9632
Friend group norms			
Stated norms	0.000	0.987	9632
More liberal (<median)	36.16%	---	9632
More conservative (>median)	36.17%	---	9632
Enacted norms*	0.422	---	9632
No friend had sex	30.68%	---	9632
Some friends had sex	41.65%	---	9632
Controls			
Parent norms			
Strongly agree	0.552	---	9632
Agree	0.241	---	9632
Neither agree no disagree	0.093	---	9632
Disagree	0.059	---	9632
Strongly disagree	0.055	---	9632
Maturity	0.170	0.909	9632
Attractiveness	0.041	1.010	9632
Religiosity	-0.067	1.010	9632
Attachment to parents	-0.076	1.008	9632
GPA	2.755	0.764	9632
Race/ethnicity			
White	53.033		
African American	17.477	---	
Native American	2.190	---	
Asian/Pacific Islander	8.740	---	
Hispanic	17.410	---	
Others	1.140	---	
Parent education			13318
< high school	0.208	---	
High school	0.251	---	
Some college	0.298	---	
Baccalaureate or more	0.243	---	
Age	16.934	1.133	13318
Sex			
Female	0.481	---	13318
Male	0.519	---	

Table 2: Associations between 'Had Sex' and Well-Being Outcomes Conditioned on **Local Stated Norms** among Friends, Classmates, and Schoolmates

	Depression			Depression			School problems		
	friends	classmates	schools	friends	classmates	schools	friends	classmates	schools
main effect of sex	0.127 ***	0.124 ***	0.111 ***	0.565 ***	0.516 ***	0.526 ***	0.154 ***	0.147 ***	0.126 ***
	(0.043)	(0.047)	(0.040)	0.055	0.079	0.059	0.042	0.045	0.037
friends more conservative *	0.004			-0.115			0.023		
had sex	(0.068)			0.095			0.053		
classmates more liberal *		-0.027			0.013			0.006	
had sex		(0.062)			0.170			0.077	
classmates more conservative *		0.028			-0.060			0.052	
had sex		(0.085)			0.121			0.069	
schoolmates more liberal *			0.025			-0.005			0.028
had sex			(0.073)			0.093			0.056
schoolmates more conservative *			0.047			-0.088			0.134
had sex			(0.092)			0.095			0.102

	School attachment			GPA		
	friends	classmates	schools	friends	classmates	schools
main effect of sex	-0.109 ***	-0.090 **	-0.114 ***	-0.118 ***	-0.153 ***	-0.145 ***
	0.036	0.042	0.035	0.040	0.046	0.033
friends more conservative *	-0.011			-0.058		
had sex	0.044			0.061		
classmates more liberal *		0.012			0.026	
had sex		0.055			0.066	
classmates more conservative *		-0.099			-0.007	
had sex		0.063			0.084	
schoolmates more liberal *			-0.044			-0.021
had sex			0.057			0.056
schoolmates more conservative *			0.062			0.003
had sex			0.078			0.075

Analyses control but do not show coefficients for parent norms, maturity, attractiveness, religiosity, attachement to parents, GPA (except where GPA is an outcome), race/ethnicty, parent education, age and gender.

Table 3: Associations between 'Had Sex' and Well-Being Outcomes Conditioned on **Local Enacted Norms** among Friends, Classmates, and Schoolmates

	Depression			Delinquency			School problems		
	friends	classmates	schools	friends	classmates	schools	friends	classmates	schools
main effect of sex	0.119 **	0.131 ***	0.133 ***	0.399 ***	0.501 ***	0.545 ***	0.130 ***	0.174 ***	0.173 ***
	0.055	0.050	0.036	0.088	0.098	0.057	0.041	0.047	0.036
any friend had sex *	0.014			0.147			0.053		
had sex	0.066			0.120			0.042		
fewer classmates*		-0.008			0.014			0.041	
had sex		0.069			0.123			0.091	
more classmates*		-0.004			0.017			-0.059	
had sex		0.066			0.186			0.053	
fewer schoolmates*			0.137			-0.215			0.132
had sex			0.147			0.141			0.143
more schoolmates*			-0.045			-0.026			-0.065
had sex			0.057			0.063			0.045

	School attachment			GPA		
	friends	classmates	schools	friends	classmates	schools
main effect of sex	-0.094 ***	-0.127 ***	-0.099 **	-0.155 ***	-0.178 ***	-0.132 ***
	0.031	0.039	0.044	0.044	0.044	0.036
any friend had sex *	-0.038			0.013		
had sex	0.041			0.051		
fewer classmates*		0.008			0.006	
had sex		0.060			0.064	
more classmates*		0.030			0.074	
had sex		0.058			0.056	
fewer schoolmates*			-0.081			-0.014
had sex			0.086			0.087
more schoolmates*			-0.010			-0.048
had sex			0.056			0.050

Analyses control but do not show coefficients for parent norms, maturity, attractiveness, religiosity, attachement to parents, GPA (except where GPA is an outcome), race/ethnicty, parent education, age and gender.