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Structuring the Future: Anticipated Life Events, Peer Networks, and Adolescent Sexual Behavior

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Abstract

While prior research has established associations between individual expectations of future events and risk behavior among adolescents, the potential effects of peers' future perceptions on risk-taking have been overlooked. We extend prior research by testing whether peers' anticipation of college completion is associated with adolescent sexual risk-taking. We also examine whether adolescents' perceptions of the negative consequences of pregnancy and idealized romantic relationship scripts mediate the association between peers' anticipation of college completion and sexual risk-taking. Results from multivariate regression models with data from the National Longitudinal Study of Adolescent Health (Add Health) indicate peers' anticipation of college completion is negatively associated with a composite measure of sexual risk-taking and positively associated with the odds of abstaining from sexual intercourse and only engaging in intercourse with a romantic partner (compared to having intercourse with a non-romantic partner). In addition, perceptions of the negative consequences of pregnancy and sexualized relationship scripts appear to mediate a large portion of the association between peers' anticipation of future success and sexual risk-taking and the likelihood of abstaining (but not engaging in romantic-only intercourse). Results from our study underscore the importance of peers in shaping adolescent sexual behavior.

INTRODUCTION

Recent estimates indicate 48% of new cases of sexually transmitted infections (STIs) occurred among persons aged 14–24 (Weinstock, Berman, and Cates 2004). In addition, while the teenage birthrate declined from 1991 to 2005, a sharp increase in teenage childbearing among 15–19 year olds occurred between 2005 and 2007 (Hamilton, Martin, and Ventura 2009; Santelli and Melnikas 2010). These figures suggest adolescents remain at risk for adverse effects of risky sexual behavior. Further insight into the development of risky sexual behavior may promote healthy outcomes among youth and young adults and advance a key objectives outlined in Healthy People 2020 (Healthy People 2010).

Researchers have examined various dimensions of sexual behavior to understand the process of sexual risk-taking. While the majority of teens are sexually active, roughly one-third of sexually active adolescents have had sex with a non-romantic partner (Manning, Longmore, and Giordano 2005). Non-romantic sexual activity is especially important to consider as it may lead to increased exposure to STIs. For instance, research indicates adolescents are more likely to use condoms with steady romantic partners (Ford, Sohn, and Lepkowski 2001; Manning, Longmore, and Giordano 2000). Additionally, non-romantic sexual intercourse may be indicative of a developing dyadic attachment style that lacks sexual commitment and entails concurrent partnering (Manning et al. 2005). Other risky behaviors, such as inconsistent condom use and sex with several partners among youth, also increase the risk of STIs and early and unplanned pregnancies (Huebner and Howell 2003).

Identifying determinants of adolescent sexual risk-taking may help promote healthy sexuality among youth and young adults (Halpern 2010).

Recent research has focused on the association between adolescents' expectations of future events and their sexual behavior (Borowsky, Ireland, and Resnick 2009; Cubbin et al. 2005). In this context, expectations of future events refer to the anticipated likelihood of experiencing significant life course outcomes such as college graduation, marriage, parenthood, or early death. Future expectations are thought to influence present behavior by informing the level of risk and perceived long-term consequences of one's actions. For example, a girl who anticipates graduating from college may think risk-taking unjustifiably jeopardizes her future. In this case, the saliency of risk and potential consequences inform risk calculation and subsequent behavior. While future perceptions are associated with risk-taking (Borowsky et al. 2009; Brezina, Tekin, and Topalli 2009; McDade et al. 2011), *few have examined how peers' anticipation of the future affects risky behavior.*

We advance research on future expectations and sexual behavior in two ways. First, using data from the National Longitudinal Study of Adolescent Health (hereafter Add Health), we test whether friends' anticipation of college completion is associated with risky sexual behavior. We hypothesize associating with peers who anticipate future success increases the likelihood of both abstaining from intercourse and only engaging in intercourse with a romantic partner compared to engaging in non-romantic intercourse. We also test whether attachment to peers who anticipate future success is associated with a composite measure of sexual behavior that captures various forms of sexual risk-taking (e.g., inconsistent condom use, sex with multiple partners, etc.). Second, we examine whether adolescents' own perceptions of the indirect consequences of sexual activity and conceptions of ideal romantic relationships mediate the association between peers' anticipation of future success and sexual risk-taking. We suggest peers' anticipation of future success influences adolescent sexual risk-taking in part by (1) informing how sexual intercourse fits within adolescents' ideal romantic relationships, and (2) helping adolescents conceptualize the personal consequences of early pregnancy. By focusing on these cognitive processes, we provide new insight into the mechanisms through which peers influence adolescent sexual risk-taking.

The following sections proceed as follows. We first review existent research on future expectations and risk behavior. Here we explore the mechanisms connecting future perceptions and behavior. We then note studies that have employed social network analysis (SNA) to understand adolescent problem behavior and highlight SNA's potential for explaining the mechanisms through which peers' future perceptions impact risk behavior. Finally, we review research that points to the potential mechanisms through which peers' anticipation of future events may impact sexual behavior.

FUTURE PERCEPTIONS AND RISK-TAKING BEHAVIOR

Ross and Hill's (2002) model of unpredictability and risk behavior suggests exposure to instability and disadvantage throughout childhood fosters unpredictability schemas that entail a belief that the world is chaotic and people are undependable (Ross and Hill 2002:458). Multiple psychological constructs are associated with this schema, including decreased self-efficacy (Bandura 1982), locus of control (Sherer et al. 1982), and a lack of future orientation (Hill, Ross, and Low 1997). As documented below, evidence suggests unpredictability schemas manifest themselves in impulsive behavior among adolescents.

Recent research highlights associations between anticipating dreary futures and risk-taking. For instance, adolescents who perceive high risk for early death are more likely to subsequently attempt suicide, experience a fight-related injury, practice unsafe sex, contract HIV, and engage in violent and non-violent delinquency (Borowsky et al. 2009; Brezina et

al. 2009). These findings provide support for extant theories regarding the association between future calculus and present risk-taking.

Gottfredson and Hirschi's (1990) theory of self-control elaborates the mechanisms through which one's own future perceptions potentially impact risk-taking. According to the model, those with low self-control are less considerate of the potential adverse consequences of behavior due to a tendency to focus on immediate and more salient rewards. As low self-control is manifested in a decreased likelihood of persisting in long-term endeavors (e.g., completing college) and delaying gratification for uncertain rewards (e.g., studying on Friday nights to attain a high status occupation), individuals with low self-control may be more likely to favor crime, sexual promiscuity, and other behavior that produce instantaneous, short-term, and definite rewards. Low attachment to conventional goals and failing to consider potential adverse consequences of risk-taking are potential mechanisms through which one's own future perceptions impact sexual behavior.

Focusing on one's own future expectations offers insight into the psychological mechanisms surrounding individuals' sexual behavior. However, ignoring social environments (e.g., peer contexts) precludes understanding how group-level variation in future expectations relates to individual risk behavior. This is a significant oversight if we seek to explain the etiology of risky sexual behavior through risk calculation, individual conceptions of sex, and future expectations. Individuals' future orientations are likely rooted in salient experiences within overlapping adolescent contexts such as schools, families, and peer groups. Risk calculation and future expectations may directly affect risk behaviors; however we argue they are rooted in individual and group experiences. Accordingly, the fundamental causes of individual risk behaviors are most likely of social origin. As such we aim to understand how social contexts shape individuals' anticipation of future events and risky sexual behavior.

SOCIAL CONTEXTS, ANTICIPATED LIFE EVENTS, AND RISK BEHAVIOR

Prior research indicates neighborhood disadvantage increases the likelihood of sexual initiation and condom non-use (Cubbin et al. 2005; Harding 2007), and that it accounts for some racial/ethnic variation in adolescent sexual behavior (Browning, Leventhal, and Brooks-Gunn 2004). For example, Browning et al. (2004) found neighborhood disadvantage explained variation in early sexual initiation among black and white adolescents in Chicago. However, the effect of neighborhood disadvantage was not mediated by collective efficacy (i.e., social cohesion and shared expectations to maintain social control among neighbors). Accordingly, the effect of disadvantage on sexual behavior is at least partially explained by processes other than collective efficacy and neighborhood social organization.

One possible reason neighborhood disadvantage is associated with sexual initiation is that chronic exposure to disadvantage leads to the anticipation of dim futures. If this is so, the effects of contextual stressors on risky behavior are likely mediated by individual-level processes such as the internalization of objective probabilities of upward mobility (MacLeod 1995). Edin and Kefalas' (2006) study of young low-income mothers highlights the relationship between future expectations and women's decisions to become mothers. Their respondents perceived fewer opportunity costs associated with having children at younger ages than middle-class women in part because they perceived early childbearing does little to affect their labor market prospects. Meanwhile, the absence of economically-successful women within their interactional contexts helped make conventional avenues for gaining social esteem and personal satisfaction, such as occupational attainment or scholastic achievement, "appear vague and tenuous" (Edin and Kefalas 2006:49). Dim economic prospects reinforced the primacy of motherhood in the construction of identity and negated much of the adverse social and life consequences of early parenting. Similarly, Anderson's

(1989) research among disadvantaged inner-city black adolescents suggests the lack of stable employment hinders males' capacity to achieve conventional markers of manhood, such as heading economically self-reliant families. Anderson proposes boys within such disadvantaged contexts emphasize sexual prowess as a means to achieve an alternative masculine identity in part because they do not anticipate realizing conventional markers of manhood.

Like social meanings of childbearing and sexual risk behavior, future prospects are rooted in shared experiences within significant contexts such as peer groups. Supporting this notion, a number of studies grounded in social network analysis suggest peer anticipation of future events influences individual risk taking. For example, Plickert (2009) found friends' academic orientation to be positively associated with adolescents' anticipation of college attendance. Furthermore, friends' academic orientation mediated the association between school dropout rates and individuals' expectations for college completion. Perceptions of future success within peer contexts may also affect risk behavior after taking into account one's own future perceptions. While not a focus of their study, Haynie et al. (2006) found peers' academic orientation to be negatively associated with adolescent violent behavior after controlling for respondents' own academic orientation. Perceptions of adverse events among one's peer group may also influence risk-taking. Recently, Haynie, Soller, and Williams (forthcoming) found peers' anticipation of early death is associated with delinquency and substance use. Together these studies suggest peers' anticipation of future events are linked to present risk-taking.

Peers' anticipation of scholastic achievement, as measured by the perceived likelihood of college completion, is a good proxy for expectations for success for two main reasons. First, compared to other markers, college completion is objectively measured. While most would agree earning a middle-class income is a marker of success, disagreement likely exists regarding what constitutes a "middle class" income. Related, there are multiple dimensions of occupational status (e.g., economic versus cultural). Furthermore, occupational structures may not entail universal status hierarchies, as occupational status and prestige include both objective (e.g. income), and subjective (e.g., skill-level) elements (Ganzeboom and Treiman 1996). Second, there are infinite paths leading to wealth accumulation; some are conventional, while others are more deviant in nature (e.g. wealth through sub-prime lending). Conversely, college completion is an objective outcome with a definite means for achievement. Accordingly, college completion likely entails greater consensus with regards to both its requirements and its status as an objective marker of success than do income and occupational attainment.¹

If isolation from persons who anticipate achieving conventional success makes future prospects seem vague and unattainable, then friendships with individuals who anticipate future success likely decreases risky sexual behavior after taking into account one's own anticipation of success. Accordingly, *we test whether peers' anticipation of college completion is negatively associated with sexual risk-taking.*

¹We tried an alternative specification of the anticipation for future success measure that included respondents' perceived likelihood of earning a middle class income by age 30 (occupational expectations were not included in Add Health). Peers' college expectations was more strongly associated with the outcomes than the combined measure. This finding reflects past research that found a stronger correlation between parental education and adolescent sexual risk behavior than parental income (Cubbin et al. 2005). Furthermore, a number of respondents in Add Health anticipated earning a middle class income but did not anticipate graduating college. This may in part be due to differences in the estimation of middle class incomes across respondents. Accordingly, perceived likelihood of college completion is likely a better measure for anticipation of future success as it relates to a specific outcome rather than a vague condition, the meaning of which varies across individuals.

Research that models the processes linking peer norms and perceptions of future prospects to individual risk behavior may provide new insights into peer influence processes. In this study we focus on factors that may account for the direct association between friends' anticipation of future success and sexual risk-taking. Building on insights from cultural sociology, we test whether adolescents' perceptions of the direct and indirect consequences of sexual risk-taking and their idealized romantic relationships help explain the association between peers' future perceptions and sexual behavior.

SEXUAL FRAMES AND STRATEGIES OF ACTION

We draw upon a cognitive approach to culture to identify mechanisms that may mediate the association between peers and respondents' anticipation of future success. According to this perspective, culture informs behavior in large part through the provision of frames and scripts. Frames help individuals understand how the world works (Goffman 1974); Kirk and Papachristos 2011) and inform expectations regarding the consequences of behavior, including sexual risk-taking (Harding 2010). Scripts represent behavioral repertoires (akin to "strategies of action" Swidler 1986) that individuals draw upon throughout interaction (Harding 2007). Scripts inform action by providing behavioral maps that may be followed in order to realize a desired outcome (e.g., an ideal relationship).

Regarding frames, associating behavior with its consequences helps individuals identify appropriate and desirable courses of action. In this sense, frames do not cause behavior through autonomic adherence to norms. Rather, frames make certain behavior more or less probable by helping individuals identify the personal and social consequences of behavior (Kirk and Papachristos 2011). Conversely, scripts inform behavior by providing individuals with behavioral strategies that may be used to "manage the social world" (Lamont and Small 2008:81) and order action throughout time (Swidler 1986). In this respect, culture informs which scripts or strategies of action are possible and more or less probable, given one's position in a cultural context or set of cultural contexts.

An emerging body of research focuses on the behavioral consequences of frames and scripts to understand young people's sexual risk-taking. For instance, Cavanagh (2007) found adolescents who would engage in sexual activity within their idealized romantic relationships were more likely to form romantic relationships in which sex occurs than does not occur. Soller and Haynie (2012b) found that sexualized romantic relationship scripts, which capture the extent to which individuals would engage in sexual behavior within idealized romantic relationships, are positively associated with the likelihood of having sexual intercourse. In another study, Soller and Haynie (2012a) found a frame in which sexual behavior is perceived to be socially-beneficial (e.g., leads to increased popularity) to be positively associated with the likelihood of having sexual intercourse. Finally, Harding (2010) suggests neighborhood-based frames regarding the romantic and sexual motives of girls influence how boys approach potential romantic and sexual partnerships.

Peers' future expectations may be linked to sexual behavior because anticipation of future success within peer contexts may inform how individuals conceptualize the consequences of sexual activity and formulate idealized strategies of action. In this sense, peers' perceptions of future success influence present sexual risk-taking by informing ideal relationship progressions and frames regarding the personal consequences of pregnancy. For instance, in a study among girls in Malawi, Frye (2012) found aspirations for academic achievement informed how girls conceptualized how sexual activity fit into their lives. Frye's respondents were frequently exposed to messages from media and school officials that promoted delaying sexual onset for the sake of educational attainment. As part of fashioning aspirational identities, these girls embraced a cultural model of educational success that

promoted self-efficacy through adopting relationship scripts that entailed delayed sexual activity. While Frye's study helps to understand how future expectations inform relationship scripts, she does not explore how *peers'* anticipation of future success may promote frames that foster negative conceptions regarding the consequences of sexual activity and the adoption of relationship scripts that involves delaying (or abstaining from) sexual intercourse.

Attending to cultural frames regarding the potential consequences of sexual activity, as well as sexualized romantic relationship scripts may help explain the processes through which peers' anticipation of college completion influences sexual risk-taking. We suggest attachment to peers with high expectations for college completion may lead adolescents to perceive indirect consequences of sexual behavior (e.g., early and unplanned pregnancy) unnecessarily jeopardize their futures. Accordingly, we hypothesize *conceptions regarding the negative consequences of pregnancy mediate the association between peers' anticipation of future success and sexual risk-taking*. Similarly, peers' anticipation of future success may lead adolescents to adopt relationship scripts in which sexual activity is either delayed or avoided. We thus hypothesize *relationship scripts that entail delaying or avoiding sexual activity mediate the association between peers' future expectations and sexual risk-taking*.

METHODS

DATA AND SAMPLE

We use data from Add Health to test our hypotheses (Resnick et al. 1997). Add Health is a nationally-representative longitudinal survey that explores the etiology of health behaviors and outcomes throughout adolescence and young adulthood. Respondents were nested within a random sample of high schools in the United States (respondents ranged from 7th to 12th graders) that was stratified by region, urbanicity, school type (i.e. public/private), ethnic makeup, and size. Each high school's largest feeder school was also recruited when available, which resulted in a sample of more than 140 schools.

All respondents in the present study completed an initial In-School questionnaire between September 1994 and April 1995 as well as two subsequent In-Home interviews in 1995 and 1996. We exclude respondents who were younger than 15 years old at the time of the first In-Home interview as questions regarding the personal consequences of pregnancy were not asked of those younger than 15. Because we focus on the association between peers' anticipation of future success and sexual risk-taking, we exclude isolates, or respondents who did not identify friends and were not nominated by others.² We also drop schools in which less than 50 percent of the student body completed the In-School questionnaire as they would yield unreliable network measures. Finally, we dropped 13 schools that did not include respondents in the first two waves of the In-Home survey. Our final sample consists of 6,255 respondents nested in 116 schools. We impute missing values on independent variables using Stata's Imputation through Chained Equations (ICE) command (Royston 2004).

DEPENDENT VARIABLES

Dependent variables were measured during the wave 2 In-Home interview, which was administered roughly a year and a half after the first In-Home interview. Our first dependent variable, *sexual risk-taking* is a composite scale that captures involvement in a number of

²We also ran models for which we recoded friends' anticipation of academic achievement to the mean for isolates and included a binary variable indicating isolate status. Those models were nearly identical to those presented in this article. We exclude isolates from the present analysis as we do not wish to make inferences on the effect of peer characteristics for isolates.

potentially risky sexual behaviors. To measure sexual risk-taking, we first assess whether respondents engaged in the following behaviors: 1) inconsistent condom use, 2) sexual intercourse with a romantic partner without first discussing contraception or sexually transmitted infections, and 3) sexual intercourse with more than one partner between waves.³ We then performed a principal component analysis (PCA) of the items that is based on tetrachoric correlations (results not displayed, available upon request)⁴ and extracted the first principal component from the analysis. The PCA revealed the items load on one factor with a single eigenvalue greater than 1. Higher values on the sexual risk-taking measure indicate greater sexual risk-taking.⁵

Our second dependent variable, *romantic/non-romantic sexual behavior*, is a 3-category nominal variable that was measured with information from a series of questions. The first category (i.e., coded “1”) includes individuals who abstained from sexual intercourse between waves or indicated that they have never had sexual intercourse. Respondents were also asked a series of questions regarding sexual activity in up to 3 “special romantic” and 3 non-romantic relationships. Those who only engaged in vaginal or anal intercourse within romantic relationships between waves 1 and 2 were coded as “2,” which indicates sexual intercourse with only romantic partners. Respondents who indicated they engaged in vaginal or anal intercourse with a non-romantic partner after the date of the wave 1 survey were coded as “3,” which indicates sexual intercourse with a non-romantic partner and serves as the reference category in our multinomial regression models. Respondents who indicated they exchanged sex for drugs or money or had non-romantic intercourse with someone other than the three non-romantic partners already identified since the wave 1 interview were also coded as “3.”⁶

ANTICIPATION OF COLLEGE COMPLETION

Respondents’ anticipation of future success is captured by a question assessing the perceived likelihood of college completion. Respondents’ *anticipation of college completion* is measured by the following question: “On a scale from ‘No chance’ to ‘It will happen’ what do you think are the chances you will graduate from college.” Initial responses ranged from 0 to 8 with higher values indicating greater anticipation of college completion. Because of the strong skewness of the measure, we collapsed responses into two categories, with 0 indicating that the respondent perceived that they have no chance (0) to less than pretty likely (5), and 1 indicating pretty likely (6) to it will happen (8) (see Haynie, Soller, and Williams [forthcoming] for a similar approach to measuring anticipation of future events). *Peer anticipation of college completion.* As part of the initial In-School survey, respondents nominated up to 5 male and 5 female friends from a roster that included individuals from the same school as well as students in sister or feeder schools. Data from these responses were used to re-construct the send and receive peer networks for each respondent, meaning that respondents’ friends include those whom they nominated, *as well as* those who nominated each focal respondent. As a result, all measures of peer characteristics potentially include

³Tetrachoric correlations are preferable for measuring correlations among binary items.

⁴We chose 2 or more partners as the cut-off following Browning et al. (2008), who examine neighborhood effects on adolescent sexual risk behavior. Using multinomial models, they found collective efficacy was negatively associated with the odds of having 2 versus 1 sexual partner, but not associated with the odds of having 0 versus 1 partner. As collective efficacy is thought to reduce risk taking among youth, these results suggest having 2 or more sexual partners in the last year is a riskier form of sexual activity than is only having 1 partner (compared to 0 partners).

⁵Data on sexual behavior were gathered using Computer-Assisted Self-Interview (CASI), where questions are heard through headphones and displayed on a computer screen and responses are entered directly into the computer by the respondent. This method helps increase the accuracy of answers by limiting interviewer-induced biases.

⁶This coding strategy allows us to estimate the odds of abstaining from intercourse or engaging in romantic intercourse compared to the odds of non-romantic intercourse with multinomial logistic regression models. It is important to distinguish between sexual intercourse with a romantic versus non-romantic partner as a growing body of research notes different outcomes associated with sexual activity that occurs in romantic relationships compared to non-romantic relationships.

data from individuals who themselves were not nominated as a friend by the respondent.⁷ *Peer anticipation of college completion* is measured by calculating the mean anticipation of college completion across respondents' friends in the send and receive network.⁸

MEDIATING PROCESSES

We examine whether cultural frames regarding the consequences of pregnancy mediate the association between peers' anticipation of college completion and sexual behavior. The first frame captures respondents' sense of the general adverse consequences of becoming pregnant (or getting someone pregnant) at this time of their lives. We measure *general pregnancy consequences* with responses to the question "It wouldn't be all that bad if you got (someone) pregnant at this time in your life." Harding (2007) notes this question captures the strength of respondents' thinking about the general consequences of pregnancy. Our second pregnancy frame measure captures respondents' perceptions of more specific adverse consequences of pregnancy. *Specific pregnancy consequences* is measured by a 3-item scale that includes responses to the following items, each prefaced by "If you got (someone) pregnant": 1) it would be embarrassing for your family, 2) it would be embarrassing for you, and 3) you would have to quit school ($\alpha=.706$). Responses for both pregnancy frame items ranged from 1 ("strongly agree") to 5 ("strongly disagree"). To construct both pregnancy frame measures we recoded responses to indicate more severe/negative consequences of pregnancy and calculated the mean of the items (for the specific pregnancy consequences frame).

We also examine whether romantic relationship scripts account for the association between peers' future expectation and sexual risk behavior. At wave 1, respondents were given 17 cards describing events (e.g., holding hands, having sex) and feelings (e.g., thinking of each other as a couple) that would potentially take place within a romantic relationship at this time in their lives. Respondents kept cards describing events/feelings they would engage in/experience and then provided the ordering in which those events would ideally occur. Following Cavanagh (2007), we first determine whether respondents would engage in a set of 5 events capturing romantic attachment, including whether the respondent and his/her partner would: 1) tell other people we were a couple, 2) go out together alone, 3) hold hands, 4) think of ourselves as a couple, and 5) kiss. We then determined whether respondents would have sexual intercourse within their ideal relationship. Next, we determined where sexual intercourse fit into the ordering of the items within the idealized romantic relationship script and constructed three binary measures capturing the relative ordering of sexual behavior within respondents' idealized romantic relationship scripts. First, *no sex in script* equals 1 for those who would not have sex in their ideal relationship. Second, *delayed sex in script* equals 1 if respondents would experience at least 4 romantic events prior to sexual intercourse. Finally, *early sex in script* equals 1 if respondents would have sex before experiencing at least 4 romantic events. *No sex in script* is the reference category.

⁷Other Add Health researchers (see McGloin 2009) have utilized information from only the send friendship network to construct measures of peer characteristics with the assumption that unreciprocated ties indicate the sender is not a friend of the non-reciprocating receiver. While we considered this approach for our analyses, we were concerned the limited number of possible gender-specific sending ties (up to 5 for each gender) may result in an overestimation of unreciprocated friendships. Accordingly, we use the send and receive network to construct peer measures. Results with models based on send-only nominations were substantively similar to those presented in this paper.

⁸Research suggests best friends are more influential than the remaining friendship group (e.g., Hussong 2002). To help ensure results are not biased by assuming homogeneity of influence among respondents' peer groups in our measure, we measured peer anticipation of college completion measured among 1) best friends (i.e., those whom the respondent nominated as either the first male or female friend, or who nominated the respondent has his/her first male/female friend) and 2) the remaining friendship group. We then measured their associations with sexual risk-taking. These models indicate anticipation of college completion among the *remaining friendship group* was more strongly associated with the outcomes. This is consistent with our perspective that it is the average anticipation of college completion across the *entire* peer group that matters for the particular association.

CONTROL VARIABLES

We include a host of control variables to account for confounding factors. Adolescents who are more invested in scholastic activities may select friends with higher expectations for future success. Conversely, friends with higher expectations for future achievement may increase one's attachment to school. Because multiple dimensions of school connectedness are associated with sexual activity (Bearman and Brückner 2001), individual and peer school attachment may confound the relationship between peer anticipation of college completion and the outcomes. We thus control for a number of measures capturing individual and peer investment in scholastic achievement in our models.

School attachment consists of a 5-item scale comprised of questions asked in the In-School survey that measure respondents' agreement with statements such as "I am happy to be at this school" and "I feel a part of the school" ($\alpha=.787$). Our measure of school attachment represents the mean of the items. *Peer school attachment* represents the mean school attachment across respondents' friends. We also control for respondents' *grade point average* (GPA), which represents the self-reported grade point average (as measured on a 4-point scale) in math, English, history/social studies, and science in the quarter/semester leading up to the In-School survey. *Peer grade point average* represents the mean GPA across respondents' send and receive network.⁹

School problems is measured with 4-items (measured during the In-School survey) capturing the frequency in which respondents had trouble completing homework assignments, paying attention in school, and getting along with teachers and students ($\alpha=.839$). We measure school problems by taking the mean of the items. *Peer school problems* is the mean school problems among friends.

We also control for other potential confounders. *Peer delinquency* is captured with an 8-item measure indicating whether respondents' friends engaged in a number of minor delinquent acts, such as fighting, lying to parents, skipping school, and substance use in the 12 months leading up to the in-school survey. Following Haynie (2002) we measure peer delinquency with the proportion of adolescents in the send and receive network who engaged in at least one delinquent activity.

Impulsivity is measured with a 4-item scale indicating the extent to which respondents agree with statements such as "When making decisions, you usually go with your 'gut feeling' without thinking too much about the consequences of each alternative" ($\alpha=.739$). Our measure of impulsivity represents the mean of the standardized items. Respondents' *desire to attend college* is captured by responses to the question (as measured during the first in-home interview): "On a scale of 1 to 5, where 1 is low and 5 is high, how much do you want to go to college?" Responses range from 1 ("low") to 5 ("high").

Family attachment is a 5-item scale that taps closeness with family members. The scale includes responses from questions such as "How close do you feel to your mother," and "How much do you think your father cares about you," with each question being asked for the mother and then the father during the wave 1 interview, for a potential total of 10 questions indicating attachment. To account for respondents in single parent households, we took the maximum value from each paired response and constructed a 5-item scale. We

⁹We do not control for peers' sexual attitudes and sexual behavior because these questions were only asked during the in-home interviews and not during the in-school interviews. As a result, we are unable to measure these variables for the majority of nominated peers in Add Health. We are able to measure peers' sexual behavior for respondents in Add Health's "saturated sample," which is a subsample of 15 schools for which Add Health attempted to interview every student in the school. We re-ran analyses with saturated schools that controlled peers' sexual behavior (not displayed, available upon request). Results from those models were substantively similar to those presented in this paper.

measure family attachment with the mean of the items ($\alpha=.843$). Our final family measure, *parents' expectation for college completion*, indicates the degree to which respondents feel their mother and/or father would be disappointed if they did not graduate college (measured during the wave 1 interview). Initial responses ranged from 1 indicating low disappointment, to 5 indicating high disappointment. To calculate the measure, we took the maximum value between each parent (or that of the sole parent for those in single-parent households).

We control for religiosity as it is associated with adolescent sexual behavior (Rostosky et al. 2004). Following Meier (2003) we measure religiosity with a 4-item scale (measured at wave 1), that captures the frequency of prayer, religious service attendance, youth group participation, and importance of religion for the respondent ($\alpha=.842$). Our religiosity measure represents the mean of the standardized items. We also include a binary measure indicating whether the respondent took an *abstinence pledge* (i.e., pledged to remain a virgin until married) prior to wave 1.

We also control for *age*, *race* (binary indicators for *black*, *Latino*, and *other* [white as reference]), and *family structure* (1=single parent household), and *parental socioeconomic status*. To measure *parental socioeconomic status*, we first obtain the highest levels of parental education and occupational status, as well as the natural log of the household income (as self-reported by the respondents' parent). We then take the mean of the standardized items to measure parental socioeconomic status. We also control for *network size*, which represents the number of sent or received friendship nominations.

In models of sexual risk-taking, we control for *prior sexual risk-taking*. To measure prior sexual risk-taking, we first determined whether the respondent reported inconsistent condom use, sexual intercourse with a romantic partner without first discussing contraception or sexually transmitted infections, and/or and sexual intercourse with more than one partner prior to the first in-home interview. As with our first dependent variable, we performed a principal component analysis of the items that is based on tetrachoric correlations and extracted the first principal component from the analysis. In models of sexual intercourse categories, we control for *prior sexual activity*, which indicates whether the respondent had a sexual relationship prior to the wave 1 interview (0=no, 1=yes).

ANALYTIC STRATEGY

We use linear regressions to measure the association between peer anticipation of future success and our composite measure of sexual risk-taking. Because romantic/non-romantic sexual behavior is nominal with three categories, we use multinomial logistic regression models to predict the log-odds of abstaining or only having intercourse in a romantic relationship, compared to having non-romantic intercourse. As non-romantic intercourse serves as our reference category, a positive coefficient for variable X in our statistical model indicates that a 1 unit increase in X results in an n unit increase in the log-odds of Y occurring, which may be abstaining or intercourse with a romantic partner only (depending on which portion of the model is being examined). We apply sampling weights constructed by the Add Health research team to make results representative of the U.S. population of in-school adolescents and adjusted for probability of selection and response rates (Chantala and Tabor 2010). We estimate all models using Stata12's *mi estimate: svy* command, which allows for the analysis of imputed data obtained through complex survey designs.

RESULTS

Bivariate Results

We first examine the means/proportions of key independent variables broken down by sexual intercourse categories (Table 1). We find those who abstained from sexual intercourse between waves have the highest values of peer anticipation of college completion, followed by those who engaged in romantic only intercourse, and those who had sexual intercourse with a non-romantic partner. Individuals who abstained from sex on average have higher expectations for college completion than respondents who had romantic or non-romantic sexual intercourse between waves.

Regarding the potential mediating variables, there are little differences in the general pregnancy consequences across sexual intercourse categories. However, those abstaining from sexual intercourse perceived slightly higher specific pregnancy consequences than those who had romantic or non-romantic sexual intercourse. With regards to ideal relationship scripts, a higher percentage of individuals who abstained from sexual intercourse between waves maintain scripts that do not include sex compared to individuals who had romantic-only intercourse and non-romantic intercourse. Conversely, higher percentages of adolescents who had sex in romantic or non-romantic relationships maintain scripts that entail early or delayed sex when compared to adolescents who abstained between waves.

Multivariate Results

Table 2 examines the association between peer anticipation of college completion and the composite measure of sexual behavior. Model 1 (Table 2) measures the association between peer anticipation of college completion and the outcome, net of control variables. Model 2 introduces the pregnancy frame variables. In Model 3 we omit the pregnancy variables and introduce relationship script measures. Finally Model 4 (the full model) reintroduces the pregnancy frame measures. We repeat this model progression in Tables 3 and 4, which display results from multinomial logit models evaluating the association between peer anticipation of college completion and sexual intercourse categories.

Risky Sexual Behavior

In Model 1 (Table 2) we find the coefficient for peer anticipation of college completion is negative and significant ($b = -.13, p < .05$), indicating attachments to peers with high anticipation of college completion is associated with less sexual risk-taking, net of control variables. However, we found no evidence respondents' own anticipation of college completion is associated with sexual risk-taking. In terms of the control variables, age is positively associated with sexual risk behavior, while boys engage in less sexual risk-taking than girls. Adolescents from single parent households engage in more sexual risk-taking than respondents from two-parent households, as do black adolescents compared to white youth. Additionally, religiosity and abstinence pledge status are negatively associated with sexual risk-taking. Desire to attend college and respondents' own GPA have marginally-significant and negative associations with the outcome. Impulsivity, peer network size, school problems, and peer delinquency are also positively associated with the outcome, while peer GPA is negatively associated with sexual risk-taking. Finally, prior sexual risk-taking is positively associated with sexual risk-taking.

Model 2 (table 2) introduces the pregnancy frame measures. We find both general ($b = -0.04, p < .01$) and specific ($b = -0.04, p < .05$) consequences of pregnancy are negatively associated with risky sexual behavior. In addition, the magnitude of the association between peer anticipation of college completion and risky sexual behavior decreases by roughly 15% after

including the pregnancy frames measures. However, peer's anticipation of college completion remains positively associated with sexual risk-taking ($b=-.11, p<.05$). These results provide some support for our hypothesis that pregnancy frames mediate the association between peer anticipation of future success and sexual risk-taking. Introducing the pregnancy frames also decreases the black coefficient to a non-significant level ($b=.04, n.s.$), suggesting the perceived consequences of pregnancy may help explain black-white gaps in sexual risk behavior.

Model 3 omits the pregnancy frame variables and introduces the relationship script measures. Compared to respondents who would not engage in sex in their ideal relationships, those who would delay sex ($b=.25, p<.01$) and who favor early sex in romantic relationships ($b=.22, p<.01$) engage in more sexual risk-taking. We also find the magnitude of the coefficient for peer anticipation of future success decreases by 8% from Model 1 but remains significant ($b=-.12, p<.05$), which provides some evidence that relationship scripts mediate part of the association between peer anticipation of college completion and the outcome. Interestingly, including the romantic relationship scripts measures decreases the coefficients for both religiosity and abstinence pledge status to marginally-significant levels, suggesting religiosity influences sexual behavior in part through variation in relationship scripts. In addition, the association between peer GPA and sexual risk-taking also becomes marginally-significant after taking into account respondents' idealized relationship scripts, suggesting some of the association between high achieving peers and sexual risk-taking is mediated by respondents' relationship scripts.

Model 4 (table 2) reintroduces the pregnancy frame measures. We find all four measures remain significantly associated with sexual risk-taking. In addition, the magnitude of the association between peers' anticipation of future success and sexual risk behavior observed in Model 1 decreases by 21% and has only a marginally-significant association with sexual risk-taking ($b=-.10, p<.10$). The reduction of the coefficient for peer anticipation of college completion in Model 4, coupled with the significant coefficients on the script and frame variables, provide evidence that relationship scripts and pregnancy frames mediate the association between peer anticipation of college completion and the outcome.

Non-Romantic Sexual Intercourse

Tables 3 and 4 display results from multinomial logistic regression models that measure the association between peers' anticipation of college completion and the relationship contexts of sexual activity. These models evaluate the log-odds that respondents abstained from sex between waves or only engaged in sex within romantic partners, compared to the log-odds of intercourse with a non-romantic partner.

As hypothesized, Model 1 (Table 3) indicates peer anticipation of college completion is positively associated with the log-odds of abstaining relative to engaging in non-romantic sexual intercourse ($b=.58, p<.05$). In addition, age, living in a single parent household, impulsivity, school problems, and peer delinquency are negatively associated with the odds of abstaining from sex, net of other control variables. Conversely, religiosity, abstinence pledge status and peers' grade point average are positively associated with the log-odds of abstaining between waves, compared to engaging in non-romantic intercourse. Compared to whites, black adolescents are less likely to abstain between waves, while members of other races/ethnicities are more likely to abstain than engage in non-romantic sexual intercourse. We also find school attachment has a positive and marginally-significant coefficient, while peer school problems has a negative and marginally-significant association with the log odds of abstaining between waves compared to having non-romantic sexual intercourse.

Model 1 also indicates peer's anticipation of educational success increases the log-odds of engaging in romantic only sex, compared to non-romantic sex ($b=.46, p<.05$). Relatively fewer control variables are associated with the log-odds of engaging in romantic only versus non-romantic intercourse. Males have lower log-odds of only engaging in romantic intercourse, while the coefficient for black is negative and significant, suggesting blacks are less likely than whites to only have sex in a romantic relationship compared to a non-romantic relationship. Respondents' school problems has a negative and marginally significant association with the likelihood of having sex only in romantic relationships compared to non-romantic relationships.

Model 2 (Table 3) introduces the pregnancy frame variables, which are both positively associated with the odds of abstaining between waves compared to having sex in a non-romantic relationship. In addition, introducing the measures decreases the magnitude of the coefficient for peers' anticipation of college completion on the log-odds of abstaining by roughly 19% ($b=.47, p<.05$), suggesting some of the association between peers' anticipation of college completion and the log-odds of abstaining between waves is mediated by frames regarding the personal consequences of pregnancy. In contrast, the two pregnancy frames are not associated with the likelihood of only having romantic sexual intercourse.

Model 3 (Table 4) omits the pregnancy frame variables and introduces the relationship script measures. Those with scripts in which sex is either delayed ($b=-.89, p<.01$) or occurs early in romantic relationships ($b=-1.05, p<.01$) are more likely to abstain between waves than have non-romantic sexual intercourse. In addition, introducing the relationship script measures decreases the magnitude of the coefficient for peer anticipation of college completion observed in Model 1 in Table 3 by roughly 10%, although the association remains significant ($b=.52, p<.05$). Results from these models suggest sexualized relationship scripts mediate some of the association between peer anticipation of college completion and the likelihood of abstaining. In addition, the positive coefficient for both abstinence pledge status in Model 1 in Table 3 becomes non-significant ($b=.28, n.s.$) after taking into account relationship scripts. Turning to the likelihood of romantic sexual intercourse, the coefficient for early sex in relationship is negative but only marginally-significant ($b=-.28, p<.10$). In addition, there is little change in the coefficient for peer anticipation of future success in Model 3 ($b=.47, p<.05$) compared to Model 1, suggesting the association between peer anticipation of college completion and the likelihood of romantic-only intercourse (compared to non-romantic intercourse) is explained by other processes.

Finally, Model 4 reintroduces the pregnancy frame measures. We find both measures remain positively and significantly associated with the log-odds of abstaining between waves compared to the likelihood of having sexual intercourse with one or more non-romantic partners. In addition, the negative and significant associations between sexualized scripts and the likelihood of abstaining remain in Model 4. We also find the coefficient for the association between peer anticipation of college completion and the likelihood of abstaining between waves decreases by 28% from Model 1 (in Table 3) with the inclusion of the pregnancy frame and script measures and becomes only marginally significant ($b=.42, p<.10$). Together these results suggest 1) peers' anticipation of college completion is associated with sexual risk-taking, and 2) a substantial portion of the association is explained by respondents' idealized relationship scripts and conceptions of the personal consequences of sexual behavior. Conversely, the magnitude of the association between peer anticipation of college completion and the likelihood of having romantic-only intercourse (compared to non-romantic intercourse) observed in Model 3 remains largely unchanged from Model 1 (Table 3).

DISCUSSION

Identifying antecedents of adolescent sexual risk-taking is an important step towards alleviating the potential adverse consequences of sexual behavior. While past research suggests young people's future perceptions are associated with their risk behavior, few have examined the association between *peer* anticipation of future events and sexual behavior. This study sought to expand upon prior research on future expectations by testing whether peers' anticipation of academic achievement is associated with sexual risk behavior using data from a nationally-representative sample of youth in the United States.

We first tested whether peer anticipation of future success was associated with a composite scale of adolescents' sexual risk-behavior. Drawing from recent social network studies focusing on peer anticipation of future events and individual risk-taking, we hypothesized peer anticipation of graduating from college would be negatively associated with sexual risk-taking, even after taking into account respondents' own perceptions of future success. We then examined whether peers' anticipation of future success is positively associated with the odds of both abstaining between waves and only having intercourse with a romantic partner, compared to the odds of having sex with a non-romantic partner. For each outcome, our models indicate those who are attached to peers and who anticipate graduating from college engage in less sexual risk-taking. These results suggest friendships with those who anticipate future success may lead to less sexual risk-taking. Importantly, these associations remained significant after controlling for individuals' own expectations for college completion.

Interestingly, we found no evidence that one's own anticipation of college completion is associated with the odds of abstaining or engaging in only romantic intercourse. We acknowledge statistical controls in our final models may have masked the association between sexual outcomes and anticipated success.¹⁰ However it is also likely the null effect was observed because the association between one's own anticipation of future success and sexual behavior varies across groups and different types of individuals. A recent study using Add Health data (Cubbin et al. 2010) found high college aspirations and perceiving a high likelihood of going to college *increased* the likelihood of sexual initiation for girls living in disadvantaged neighborhoods. The reverse was true for girls living in neighborhoods with low disadvantage. Harris et al. (2002) found expectations of graduating from college were negatively associated with the odds of sexual initiation among adolescent boys but not girls. Whatever the cause of the null effects in the multivariate models observed in the present study, the relationship between individual future perceptions and adolescent sexual behavior is complicated and merits further study.

We also explored cultural processes that potentially mediate the association between peers' anticipation of college completion and sexual risk-taking. We suggest expectations for college completion within peer groups may discourage risky sex because peers may foster the perception that risky sexual behavior jeopardizes positive future outcomes. We thus examined whether conceptions of sexual behavior within idealized romantic relationships and the personal consequences of pregnancy mediate the association between peers' future perceptions and sexual risk-taking. We found evidence that frames regarding the consequences of pregnancy and conceptions of sexual behavior within idealized romantic relationship scripts account for a substantial portion of the association between peer expectations of college completion and sexual risk-taking. These findings support the

¹⁰We ran models identical to Model 1 in Table 2 and Model 1 in Table 3 that omitted peer anticipation of college completion. We found only a marginally-significant association between respondents' anticipation of future success and the odds of abstaining ($b = .238, p < .10$), however this association became non-significant after including peers' anticipation of future success.

assertion that peers may influence sexual risk-taking by informing how adolescents formulate romantic relationship scripts and how they conceptualize the personal consequences of early and unplanned pregnancy.

We situate these latter findings within an approach to culture that focuses on scripts and frames to understanding the link between culture and action. For instance, Harding (2007, 2010) and others (Lamont and Small 2008) suggest culture informs action through processes in which individuals draw upon larger cultural climates to identify potential strategies of action and conceptualize the social and personal consequences of behavior. This cultural model suggests individuals enact behavior through a cognitive process that entails the formation of cultural “tool kits” (Swidler 1986) from which they identify ideal strategies of action. We advance this approach to culture by suggesting scripts and frames relevant to sexual risk-taking are at least in part informed by peers’ conceptions of future events. Subsequent research that models the effects of peer contexts on the formation of scripts and frames may shed more light onto the process through which lived experiences inform frames and strategies of action. This research may also provide more insight into risky sexual activity among youth, as well as adolescents’ sexual decision-making processes more generally.

We also situate our findings within an emerging perspective that focuses on the development of normative sexuality among adolescents. As Tolman and McClelland (2011) note, sexuality is a normative aspect of adolescence. Researchers and policy makers must acknowledge that not all adolescent sexual behavior is inherently risky. Additionally, sexual behavior may have negligible or even positive effects on adolescents’ well-being (e.g., increased emotional attachment to one’s partner). Most importantly, developing a positive sexual selfhood during adolescence may lead to healthier sexual practices throughout the life course. That said, our results point to mechanisms through which peer characteristics may lead to risky sexual behavior that potentially jeopardize adolescents’ life trajectories. Anticipations of dim futures may hinder healthy sexual development by informing decisions regarding risky sexual behavior. Further research may shed more light onto these processes.

Though this study adds to the understanding of risky sexual behavior among adolescents, it is not without its limitations. While we use two waves of data to test our hypotheses, we can only measure friend characteristics during the first wave. Thus our models cannot address how sexual activity or anticipation for future academic achievement affect network composition. Accordingly, the association between peer anticipation of future success and the outcomes observed in our models may be explained through friendship selection processes. For instance, personal characteristics (e.g., prior sexual behavior) that lead to future risk-taking may lead adolescents to select friends who are academically disinclined or do not anticipate scholastic achievement. However, supplementary analyses stratified by prior sexual intercourse (i.e., self-reported at wave 1) resulted in substantively similar results as those presented in this article (results are available from the authors upon request). These analyses suggest our results are not driven by friendship selection on the basis of adolescents’ own sexual behavior. Dynamic longitudinal modeling techniques such as SIENA (Simulation Investigation for Empirical Network Analysis; see Steglich, Snijders, and Pearson [2010]), which allow for simultaneous examination of selection and influence processes, may be used to provide more insight into friendship selection and peers influence processes overtime.

We also did not assess whether anticipation for academic achievement among non-school friends is associated with sexual behavior. While Add Health gathered information on the presence of friends who do not attend the sampled school or its sister school, those persons were not interviewed. As a result, we are unable to assess how features of non-school

networks affect sexual activity. This limitation is notable given the association between neighborhood disadvantage and sexual risk behavior observed in prior research (Browning et al. 2004; Harding 2007, 2010). Studies that examine the relationship between features of non-school social networks will likely shed more light onto adolescent sexual behavior. Finally, our study only focuses on the influence of peers to whom individuals are directly connected. Future research focusing on the influence of future expectations at the school-level (Harris et al. 2002), as well as those to whom one is indirectly tied (Payne and Cornwell 2007; Soller and Haynie 2012b), will advance the understanding of the influence of less proximate peers on sexual behavior. Prior research has found associations between individuals' own anticipation of future achievement and their risk behavior. This study provides one of the first attempts to examine the effect of friends' perceptions of future success on sexual behavior. Findings from this study suggest friends' future expectations matter more than one's own perceptions in shaping sexual behavior among adolescents. Alternatively, one's own perceptions may matter, however only under certain circumstances. Regardless, our findings challenge future researchers to identify instances in which individual perceptions affect sexual risk behaviors. This study also opens multiple avenues of research that may shed light onto the processes through which friends' anticipation for future success affect individuals risk calculations and associated behavior. We should take seriously the notion that peers' future expectations may impact adolescent development outcomes, including their sexual behavior.

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REFERENCES

- Anderson, Elijah. Sex codes and family life among poor inner-city youths. *The Annals of the American Academy of Political and Social Science*. 1989; 501:59–78.
- Bandura, Albert. Self-efficacy mechanism in human agency. *American Psychologist*. 1982; 37:122–147.
- Bearman, Peter S.; Brückner, Hannah. Promising the Future: Virginity Pledges and First Intercourse. *The American Journal of Sociology*. 2001; 106:859–912.
- Borowsky, Iris Wagman; Ireland, Marjorie; Resnick, Michael D. Health Status and Behavioral Outcomes for Youth Who Anticipate a High Likelihood of Early Death. *Pediatrics*. 2009; 124:81–88.
- Brezina, Timothy; Tekin, Erdal; Topalli, Volkan. Might Not Be a Tomorrow': A Multi-Methods Approach to Anticipated Early Death and Youth Crime. *Criminology*. 2009; 47:1091–1129.
- Browning, Christopher R.; Burrington, Lori A.; Leventhal, Tama; Brooks-Gunn, Jeanne. Neighborhood Structural Inequality, Collective Efficacy, and Sexual Risk Behavior Among Urban Youth. *Journal of Health and Social Behavior*. 2008; 49:269–285. [PubMed: 18771063]
- Browning, Christopher R.; Leventhal, Tama; Brooks-Gunn, Jeanne. Neighborhood context and racial differences in early adolescent sexual activity. *Demography*. 2004; 41:697–720. [PubMed: 15622950]
- Cavanagh, Shannon E. The Social Construction of Romantic Relationships in Adolescence: Examining the Role of Peer Networks, Gender, and Race*. *Sociological Inquiry*. 2007; 77:572–600.
- Chantala, Kim; Tabor, Joyce. [Retrieved May 25, 2011] Strategies to Perform a Design-Based Analysis Using the Add Health Data. 2010. (<http://www.cpc.unc.edu/projects/addhealth/faqs/aboutdata/weight1.pdf>)
- Cubbin, Catherine; Brindis, Claire D.; Jain, Sonia; Santelli, John; Braveman, Paula. Neighborhood Poverty, Aspirations and Expectations, and Initiation of Sex. *Journal of Adolescent Health*. 2010; 47:399–406. [PubMed: 20864010]

- Cubbin, Catherine; Santelli, John; Brindis, Claire D.; Braveman, Paula. Neighborhood context and sexual behaviors among adolescents: Findings from the National Longitudinal Study of Adolescent Health. *Perspectives on Sexual and Reproductive Health*. 2005; 37:125–134. [PubMed: 16150660]
- Edin, Katherine; Kefalas, Mary. *Promises I can keep: Why poor women put motherhood before marriage*. Berkeley, CA: University of California Press; 2006.
- Ford, Kathleen; Sohn, Woosung; Lepkowski, James. Characteristics of Adolescents' Sexual Partners and Their Association with Use of Condoms and Other Contraceptive Methods. *Family Planning Perspectives*. 2001; 33:100–132. [PubMed: 11407432]
- Frye, Margaret. Bright Futures in Malawi's New Dawn: Educational Aspirations as Assertions of Identity. *American Journal of Sociology*. 2012; 117:1565–1624.
- Ganzeboom, Harry BG.; Treiman, Donald J. Internationally comparable measures of occupational status for the 1988 International Standard Classification of Occupations. *Social Science Research*. 1996; 25:201–239.
- Goffman, Erving. *Frame Analysis: An Essay on the Organization of Experience*. Boston: Harvard University Press; 1974.
- Gottfredson, Michael R.; Hirschi, Travis. *A General Theory of Crime*. Stanford University Press; 1990.
- Halpern, Carolyn Tucker. Reframing Research on Adolescent Sexuality: Healthy Sexual Development as Part of the Life Course. *Perspectives on Sexual and Reproductive Health*. 2010; 42:6–7. [PubMed: 20415876]
- Hamilton, Brady E.; Martin, Joyce A.; Ventura, Sharon J. Births: Preliminary data for 2007. *National Vital Statistics Report*. 2009; 57:1–23.
- Harding, David J. Cultural Context, Sexual Behavior, and Romantic Relationships in Disadvantaged Neighborhoods. *American Sociological Review*. 2007; 72:341–364.
- Harding, David J. *Living the Drama: Community, Conflict and Culture Among Inner-City Boys*. Chicago: University of Chicago Press; 2010.
- Harris, Kathleen Mullan; Duncan, Greg J.; Boisjoly, Johanne. Evaluating the Role of 'Nothing to Lose' Attitudes on Risky Behavior in Adolescence. *Social Forces*. 2002; 80:1005–1039.
- Haynie, Dana L. Friendship Networks and Adolescent Delinquency: The Relative Nature of Peer Delinquency. *Journal of Quantitative Criminology*. 2002; 18:99–134.
- Haynie, Dana L.; Silver, Eric; Teasdale, Brent. Neighborhood Characteristics, Peer Networks, and Adolescent Violence. *Journal of Quantitative Criminology*. 2006; 22:147–169.
- Haynie, Dana L.; Soller, Brian; Williams, Kristi L. Anticipating Early Fatality: Friends', Schoolmates' and Individual Perceptions of Fatality on Adolescent Risk Behaviors. *Journal of Youth and Adolescence*. forthcoming.
- Healthy, People. *Healthy People 2020*. Washington, DC: United States Department of Health and Human Services, United States Government Printing Office; 2010.
- Hill, Elizabeth M.; Ross, Lisa T.; Low, Bobbi S. The role of future unpredictability in human risk-taking. *Human Nature*. 1997; 8:287–325.
- Huebner, Angela J.; Howell, Laurie W. Examining the relationship between adolescent sexual Risk-Taking and perceptions of monitoring, communication, and parenting styles. *Journal of Adolescent Health*. 2003; 33:71–78. [PubMed: 12890597]
- Hussong, Andrea M. Differentiating peer contexts and risk for adolescent substance abuse. *Journal of Youth and Adolescence*. 2002; 31:207–220.
- Kirk, David S.; Papachristos, Andrew V. Cultural Mechanisms and the Persistence of Neighborhood Violence. *American Journal of Sociology*. 2011; 116:1190–1233.
- Lamont, Michele; Small, Mario Louis. *How Culture Matters: Enriching Our Understanding of Poverty*. In: Lin, Ann; Harris, David, editors. *The Colors of Poverty: Why Racial and Ethnic Disparities Persist*. New York: Russell Sage Foundation; 2008. p. 76-102.
- MacLeod, Jay. *Ain't no makin' it: Aspirations and Attainment in a Low-Income Neighborhood*. Boulder, CO: Westview Press; 1995.

- Manning, Wendy D.; Longmore, Monica A.; Giordano, Peggy C. The Relationship Context of Contraceptive Use at First Intercourse. *Family Planning Perspectives*. 2000; 32:104–110. [PubMed: 10894255]
- Manning, Wendy D.; Longmore, Monica A.; Giordano, Peggy C. Adolescents' involvement in non-romantic sexual activity. *Social Science Research*. 2005; 34:384–407.
- McDade, Thomas W., et al. Adolescents' expectations for the future predict health behaviors in early adulthood. *Social Science & Medicine*. 2011; 73:391–398. [PubMed: 21764487]
- McGloin, Jean Marie. Delinquency Balance: Revisiting Peer Influence. *Criminology*. 2009; 47:439–477.
- Meier, Ann M. Adolescents' Transition to First Intercourse, Religiosity, and Attitudes about Sex. *Social Forces*. 2003; 81:1031–1052.
- Payne, Danielle; Cornwell, Benjamin. Reconsidering Peer Influences on Delinquency: Do Less Proximate Contacts Matter? *Journal of Quantitative Criminology*. 2007; 23:127–149. 149.
- Plickert, Gabriele. PdD dissertation. Toronto, CA.: Graduate Department of Sociology, Department of University of Toronto; 2009. What's Expected? Anticipation of Education and School and Peer Contexts in a National Longitudinal Study of Youth.
- Resnick, Michael D., et al. Protecting Adolescents From Harm: Findings From the National Longitudinal Study on Adolescent Health. *The Journal of the American Medical Association*. 1997; 278:823–832.
- Ross, Lisa Thomson; Hill, Elizabeth M. Childhood Unpredictability, Schemas for Unpredictability, and Risk Taking. *Social Behavior & Personality: An International Journal*. 2002; 30:453–473.
- Rostosky, Sharon Scales; Wilcox, Brian L.; Wright, Margaret Laurie Comer; Randall, Brandy A. The Impact of Religiosity on Adolescent Sexual Behavior: A Review of the Evidence. *Journal of Adolescent Research*. 2004; 19:677–697.
- Royston, Patrick. Multiple Imputation of Missing Values. *Stata Journal*. 2004; 4:227–241.
- Santelli, John S.; Melnikas, Andrea J. Teen Fertility in Transition: Recent and Historic Trends in the United States. *Annual Review of Public Health*. 2010; 31:371–383.
- Sherer M, et al. The self-efficacy scale: Construction and validation. *Psychological reports*. 1982; 51:663–671.
- Soller, Brian; Haynie, Dana L. Putting the sexual double standard in its place: frames, peer status, and sexual behavior; Paper presented at the Annual Meeting of the American Sociological Association; August 19; Denver, CO. 2012a.
- Soller, Brian; Haynie, Dana L. Scripts, sects, and sex: A network approach of reference groups; Paper presented at the Annual Meeting of the Population Association of America; May, 4; San Francisco, CA.. 2012b.
- Steglich, Christian; Snijders, Tom AB.; Pearson, Michael. Dynamic Networks and Behavior: Separating Selection from Influence. *Sociological Methodology*. 2010; 40:329–393.
- Swidler, Ann. Culture in Action: Symbols and Strategies. *American Sociological Review*. 1986; 51:273–286.
- Tolman, Deborah L.; McClland, Sara I. Normative sexuality development in adolescence: A decade in review, 2000–2009. *Journal of Research on Adolescence*. 2011; 21:242–255.
- Weinstock, Hillard; Berman, Stuart; Cates, Willard. Sexually Transmitted Diseases among American Youth: Incidence and Prevalence Estimates, 2000. *Perspectives on Sexual and Reproductive Health*. 2004; 36:6–10. [PubMed: 14982671]

Biographies

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Table 1

Descriptive Statistics

	Total Sample		Abstained Between Waves		Romantic Intercourse Only		Non-Romantic Intercourse	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Dependent Variables								
Sexual Risk-Taking	-.75	(.81)	-1.34	(.07)	-.41	(.67)	.13	(.90)
Abstained from Intercourse	.48	(.50)						
Romantic-Only Sexual Intercourse	.32	(.47)						
Non-Romantic Sexual Intercourse	.20	(.40)						
Individual Control Variables								
Age	16.63	(.99)	16.43	(.94)	16.82	(.99)	16.79	(1.00)
Male	.49	(.50)	.49	(.50)	.42	(.49)	.58	(.49)
White	.54		.55		.54		.51	
Black	.21		.16		.24		.29	
Latino	.15		.16		.15		.15	
Other	.10		.14		.07		.06	
Single Parent Household	.28		.22		.33		.34	
Socioeconomic Status	.00	(.79)	.08	(.80)	-.08	(.77)	-.05	(.77)
Parental Attachment	4.48	(.57)	4.54	(.53)	4.42	(.61)	4.43	(.59)
Parents' Expectation for College Completion	4.17	(1.18)	4.26	(1.12)	4.10	(1.22)	4.06	(1.22)
Religiosity	-.02	(.82)	.11	(.81)	-.13	(.82)	-.16	(.82)
Abstinence Pledge	.12		.19		.07		.06	
Network Size	7.24	(4.21)	7.04	(4.15)	7.58	(4.26)	7.17	(4.24)
Grade Point Average	2.75	(.79)	2.89	(.78)	2.66	(.78)	2.56	(.76)
Anticipation of College Completion	.76	(.43)	.81	(.39)	.71	(.45)	.70	(.46)
Desire to Attend College	4.45	(1.01)	4.60	(.89)	4.32	(1.10)	4.32	(1.08)
Impulsivity	2.17	(.61)	2.14	(.60)	2.18	(.61)	2.22	(.61)
School Attachment	3.69	(.74)	3.82	(.68)	3.59	(.76)	3.56	(.78)
School Problems	1.01	(.69)	.90	(.64)	1.08	(.71)	1.19	(.73)
Prior Sexual Risk-Taking	-.08	(.86)	-.48	(.43)	.17	(.94)	.48	(1.04)

	Total Sample		Abstained Between Waves		Romantic Intercourse Only		Non- Romantic Intercourse	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Prior Sexual Activity	.50	(.50)	.21	(.41)	.75	(.44)	.77	(.42)
Peer Variables								
Peer School Attachment	3.59	(.46)	3.65	(.46)	3.53	(.46)	3.53	(.47)
Peer School Problems	1.54	(.58)	1.48	(.58)	1.58	(.56)	1.59	(.58)
Peer Delinquency	.93	(.13)	.92	(.14)	.94	(.12)	.94	(.12)
Peer Grade Point Average	2.77	(.50)	2.87	(.51)	2.69	(.48)	2.66	(.48)
Peer Anticipation of College Completion	.76	(.25)	.80	(.25)	.75	(.25)	.72	(.26)
Pregnancy Frames								
General Pregnancy Consequences	4.27	(.96)	4.43	(.85)	4.13	(1.03)	4.11	(1.05)
Specific Pregnancy Consequences	3.32	(.98)	3.56	(.91)	3.11	(.98)	3.06	(1.01)
Romantic Relationship Scripts								
No Sex in Script	.50		.70		.35		.28	
Delayed Sex in Script	.30		.17		.41		.41	
Early Sex in Script	.20		.13		.24		.31	
N	6,255		3,010		2,000		1,245	

Table 2
 Linear Regression Models of Sexual Risk-Taking Regressed on Peer Anticipation of College Completion and Peer and Individual Variables

Variable	Model 1	Model 2	Model 3	Model 4
Individual Control Variables				
Age	.06** (.01)	.05** (.01)	.05** (.01)	.04** (.01)
Male	-.07* (.03)	-.07* (.03)	-.11** (.03)	-.10** (.03)
Black	.07* (.04)	.04 (.04)	.05 (.03)	.02 (.04)
Latino	.03 (.04)	.02 (.04)	.03 (.03)	.01 (.03)
Other	-.06 (.04)	-.07 (.04)	-.06 (.04)	-.06 (.04)
Single Parent Household	.08** (.03)	.08* (.03)	.08* (.03)	.08* (.03)
Socioeconomic Status	.01 (.02)	.01 (.02)	.01 (.02)	.01 (.02)
Parental Attachment	-.04 (.02)	-.03 (.02)	-.03 (.02)	-.03 (.02)
Parents' Expectations for College Completion	.00 (.01)	.01 (.01)	.00 (.01)	.01 (.01)
Religiosity	-.06** (.02)	-.06** (.02)	-.04+ (.02)	-.04* (.02)
Abstinence Pledge	-.10** (.03)	-.10** (.03)	-.06+ (.03)	-.06 (.03)
Network Size	.01** (.00)	.01** (.00)	.01** (.00)	.01** (.00)
Grade Point Average	-.04+ (.02)	-.04+ (.02)	-.04+ (.02)	-.04* (.02)
Anticipation of College Completion	.01 (.04)	.02 (.04)	.02 (.04)	.02 (.04)
Desire to Attend College	-.02+ (.01)	-.02 (.01)	-.02+ (.01)	-.02 (.01)
Impulsivity	.08** (.02)	.07** (.02)	.08** (.02)	.07** (.02)
School Attachment	-.01 (.02)	-.01 (.02)	-.01 (.02)	-.01 (.02)
School Problems	.04* (.02)	.04* (.02)	.04+ (.02)	.03+ (.02)
Prior Sexual Risk-Taking	.39** (.02)	.38** (.02)	.35** (.02)	.35** (.02)
Peer Variables				
Peer School Attachment	.00 (.03)	.01 (.03)	.01 (.03)	.01 (.03)
Peer School Problems	.02 (.02)	.02 (.02)	.02 (.02)	.02 (.02)
Peer Delinquency	.27** (.08)	.26** (.08)	.25** (.08)	.25** (.08)
Peer Grade Point Average	-.07* (.03)	-.06* (.03)	-.06+ (.03)	-.05+ (.03)
Peer Anticipation of College Completion	-.13* (.05)	-.11* (.05)	-.12* (.05)	-.10+ (.05)

Variable	Model 1	Model 2	Model 3	Model 4
Mediating Variables				
General Pregnancy Consequences		-.04** (.01)		-.04** (.01)
Specific Pregnancy Consequences		-.04* (.01)		-.03* (.01)
Delayed Sex in Relationship Script			.25** (.03)	.24** (.03)
Early Sex in Romantic Relationship Script			.22** (.04)	.21** (.04)
Intercept	-1.57** (.33)	-1.29** (.36)	-1.53** (.33)	-1.30** (.35)

Note: Standard errors in parentheses. Missing values on individual-level variables were imputed using multiple imputation with 10 replications. Individual N = 6,255; School N = 75.

** $p < .01$,

* $p < .05$,

+ $p < .10$ (two-tailed tests).

Table 3
Multinomial Logit Models of Sexual Intercourse Categories Regressed on Peer Anticipation of College Completion and Peer and Individual Variables

	Model 1		Model 2	
	Abstained Between Waves	Romantic Intercourse Only	Abstained Between Waves	Romantic Intercourse Only
Individual Control Variables				
Age	-.24** (.07)	.07 (.06)	-.23** (.07)	.08 (.06)
Male	-.08 (.13)	-.64** (.10)	-.11 (.13)	-.65** (.10)
Black	-.88** (.16)	-.39** (.14)	-.72** (.16)	-.36* (.14)
Latino	-.03 (.14)	.03 (.20)	.03 (.14)	.04 (.20)
Other	.46* (.21)	.09 (.26)	.50* (.21)	.10 (.25)
Single Parent Household	-.42** (.14)	-.03 (.12)	-.39** (.15)	-.02 (.12)
Socioeconomic Status	.08 (.09)	-.03 (.07)	.05 (.08)	-.04 (.07)
Parental Attachment	-.07 (.09)	-.05 (.08)	-.10 (.09)	-.05 (.08)
Parents' Expectation for College Completion	-.03 (.04)	-.05 (.04)	-.05 (.04)	-.05 (.04)
Religiosity	.35** (.08)	.10 (.07)	.34** (.08)	.10 (.07)
Abstinence Pledge	.44* (.18)	-.07 (.20)	.39* (.18)	-.08 (.20)
Network Size	-.03** (.01)	.01 (.01)	-.04** (.01)	.01 (.01)
Grade Point Average	.09 (.08)	.04 (.06)	.09 (.08)	.04 (.06)
Anticipation of College Completion	.07 (.15)	-.12 (.14)	.05 (.15)	-.12 (.14)
Desire to Attend College	.06 (.07)	.02 (.07)	.04 (.07)	.01 (.07)
Impulsivity	-.23* (.09)	-.13 (.10)	-.21* (.09)	-.12 (.10)
School Attachment	.17+ (.09)	.04 (.08)	.18* (.09)	.04 (.08)
School Problems	-.25* (.10)	-.14+ (.08)	-.24* (.10)	-.13+ (.08)
Prior Sexual Behavior	-.214** (.10)	-.07 (.11)	-.209** (.11)	-.06 (.11)
Peer Variables				
Peer School Attachment	.03 (.14)	-.05 (.12)	.03 (.14)	-.05 (.12)
Peer School Problems	-.18+ (.10)	-.03 (.09)	-.18+ (.10)	-.03 (.09)
Peer Delinquency	-.146** (.53)	-.76 (.46)	-.146** (.54)	-.78+ (.46)

	Model 1		Model 2	
	Abstained Between Waves	Romantic Intercourse Only	Abstained Between Waves	Romantic Intercourse Only
Peer Grade Point Average	.33* (.13)	-.04 (.10)	.31* (.13)	-.04 (.10)
Peer Anticipation of College Completion	.58* (.22)	.46* (.18)	.47* (.22)	.45* (.18)
Mediating Variables				
General Pregnancy Consequences			.17** (.05)	.00 (.05)
Specific Pregnancy Consequences			.23** (.07)	.06 (.05)
Intercept	6.58** (1.50)	1.01 (1.36)	5.22** (1.51)	.79 (1.33)

Note: Standard errors in parentheses. Missing values on individual-level variables were imputed using multiple imputation with 10 replications. Individual N = 6,255; School N = 75.

** $p < .01$,

* $p < .05$,

+ $p < .10$ (two-tailed tests).

Table 4
Multinomial Logit Models of Sexual Intercourse Categories Regressed on Peer Anticipation of College Completion and Peer and Individual Variables

	Model 3		Model 4	
	Abstained Between Waves	Romantic Intercourse Only	Abstained Between Waves	Romantic Intercourse Only
Individual Control Variables				
Age	-.21** (.07)	.08 (.06)	-.20** (.07)	.08 (.06)
Male	.11 (.12)	-.60** (.10)	.09 (.12)	-.61** (.10)
Black	-.75** (.15)	-.37* (.14)	-.61** (.15)	-.34* (.14)
Latino	.01 (.14)	.05 (.20)	.07 (.14)	.06 (.20)
Other	.49* (.22)	.11 (.26)	.52* (.22)	.11 (.26)
Single Parent Household	-.40** (.14)	-.03 (.12)	-.38* (.14)	-.02 (.12)
Socioeconomic Status	.09 (.09)	-.03 (.07)	.06 (.09)	-.04 (.07)
Parental Attachment	-.08 (.09)	-.05 (.08)	-.10 (.09)	-.05 (.08)
Parents' Expectation for College Completion	-.04 (.04)	-.05 (.04)	-.05 (.04)	-.05 (.04)
Religiosity	.26** (.08)	.09 (.07)	.26** (.08)	.09 (.07)
Abstinence Pledge	.28 (.18)	-.09 (.20)	.24 (.18)	-.10 (.20)
Network Size	-.04** (.01)	.01 (.01)	-.04** (.01)	.01 (.01)
Grade Point Average	.10 (.08)	.04 (.06)	.10 (.08)	.03 (.06)
Anticipation of College Completion	.03 (.16)	-.13 (.14)	.02 (.15)	-.14 (.14)
Desire to Attend College	.06 (.07)	.01 (.07)	.04 (.07)	.01 (.07)
Impulsivity	-.22* (.09)	-.12 (.10)	-.20* (.09)	-.12 (.10)
School Attachment	.15+ (.09)	.03 (.08)	.15+ (.09)	.03 (.08)
School Problems	-.23* (.10)	-.13 (.08)	-.23* (.10)	-.13 (.08)
Prior Sexual Risk-Taking	-1.88** (.10)	-.04 (.11)	-1.85** (.10)	-.04 (.11)
Peer Variables				
Peer School Attachment	.01 (.14)	-.04 (.12)	.00 (.14)	-.05 (.12)
Peer School Problems	-.18+ (.10)	-.03 (.09)	-.18+ (.10)	-.02 (.09)
Peer Delinquency	-1.50** (.55)	-.83+ (.46)	-1.50** (.56)	-.85+ (.46)

	Model 3		Model 4	
	Abstained Between Waves	Romantic Intercourse Only	Abstained Between Waves	Romantic Intercourse Only
Peer Grade Point Average	.31* (.13)	-.04 (.10)	.29* (.13)	-.04 (.10)
Peer Anticipation of College Completion	.52* (.23)	.47* (.18)	.42+ (.24)	.45* (.18)
Mediating Variables				
General Pregnancy Consequences			.14** (.05)	-.01 (.05)
Specific Pregnancy Consequences			.21** (.07)	.06 (.05)
Delayed Sex in Romantic Relationship Script	-.89** (.11)	-.02 (.10)	-.86** (.11)	-.01 (.10)
Early Sex in Romantic Relationship Script	-1.05** (.16)	-.27+ (.15)	-1.00** (.15)	-.26+ (.15)
Intercept	6.60** (1.51)	1.02 (1.35)	5.41** (1.52)	.82 (1.31)

Note: Standard errors in parentheses. Missing values on individual-level variables were imputed using multiple imputation with 10 replications. Individual N = 6,255; School N = 75.

** $p < .01$,

* $p < .05$,

+ $p < .10$ (two-tailed tests).