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Norms as Group-Level Constructs: Investigating School-Level Teen Pregnancy Norms and Behaviors

Stefanie Mollborn^a, Benjamin W. Domingue, and Jason D. Boardman

University of Colorado Boulder

Abstract

Social norms are a group-level phenomenon, but past quantitative research has rarely measured them in the aggregate or considered their group-level properties. We used the school-based design of the National Longitudinal Study of Adolescent Health to measure normative climates regarding teen pregnancy across 75 U.S. high schools. We distinguished between the strength of a school's norm against teen pregnancy and the consensus around that norm. School-level norm strength and dissensus were strongly ($r = -0.65$) and moderately ($r = 0.34$) associated with pregnancy prevalence within schools, respectively. Normative climate partially accounted for observed racial differences in school pregnancy prevalence, but norms were a stronger predictor than racial composition. As hypothesized, schools with both a stronger average norm against teen pregnancy and greater consensus around the norm had the lowest pregnancy prevalence. Results highlight the importance of group-level normative processes and of considering the local school environment when designing policies to reduce teen pregnancy.

Keywords

schools; norms; teen pregnancy; adolescence

Teen motherhood is considered “a bad thing for our society” by 94% of U.S. adults (Pew Social Trends Poll 2009). The persistence of a behavior that the bulk of society views as problematic has caused teen pregnancy to be framed as a cultural phenomenon related to the development and reinforcement of atypical social norms. For example, opinion leaders write that teenagers today are getting the message that teen pregnancy is cool (Morand 2009). Some researchers have reported weaker norms against teen pregnancy in low-income,

^aCorresponding author. Institute of Behavioral Science and Department of Sociology, 1440 15th Street, Boulder, CO 80309-0483. mollborn@colorado.edu. Phone: (303) 735-3796. All authors contributed equally to this project.

About the Authors: Stefanie Mollborn is an Associate Professor in the Health and Society Program at the Institute of Behavioral Science and in the Department of Sociology, University of Colorado Boulder. She conducts research on teen parenthood, social norms, social stratification, and early childhood. Her recent work has appeared in *Demography*, *Gender & Society*, *Journal of Marriage and Family*, and *Social Psychology Quarterly*.

Benjamin W. Domingue is currently a research associate at the Institute of Behavioral Science, University of Colorado Boulder. He is an expert in the application of advanced statistical methods to important questions within education research, demography, and social network analysis. His work in these areas has appeared in *Psychometrika*, *Proceedings of the National Academy of Sciences*, and *Demography*.

Jason D. Boardman is an Associate Professor in the Department of Sociology and Research Associate in the Population Program at the Institute of Behavioral Science, University of Colorado Boulder. He is a social demographer who studies health determinants and health behaviors with an emphasis on gene-environment research. His work has been published in *Proceedings of the National Academy of Sciences*, *Demography*, *Journal of Health & Social Behavior*, and *American Journal of Public Health*.

predominantly African American or Hispanic communities compared to others (e.g., Burton 1990), and others have emphasized the heterogeneity of normative messages and weaker norm enforcement in disadvantaged social contexts (e.g., Harding 2007; Sampson, Raudenbush, and Earls 1997). While sociological theories identify norms as properties of social groups (Durkheim 1951 [1897]), existing research on teen pregnancy has operationalized norms at the level of the individual (e.g., Mollborn 2009) or inferred them from predominant patterns of behavior (e.g., Brewster 1994a; Sucoff and Upchurch 1998). As Stark (1996) has argued for religion, we advocate considering teen pregnancy norms to be a “group property,” with individual behaviors having different implications depending on the social normative context they are situated within. Individual-level analyses alone cannot address this.

The mismatch between the theoretical and empirical approaches to norm assessment is critical because policies designed to reduce teen pregnancy may need to focus on the social contexts in which shared understandings about sexual behaviors take shape and on the factors that structure these contexts, rather than on individuals' understandings of the risks or rewards of parenthood. Thus, a group-based approach to measuring norms is needed. Some recent theoretical developments in the study of norms have focused on the purposes they serve: giving people motives for engaging in behaviors, or providing the means for justifying one's own behavior after the fact (Swidler 2001; Vaisey 2010). While we agree that this discussion is important, we maintain that further theoretical and empirical development on the conceptualization of norms themselves is another important goal.

Schools are an important site of influence on teens' sexual behaviors, more so than neighborhoods (Teitler and Weiss 2000). Norms about teen pregnancy capture unique aspects of school context and composition that may be otherwise difficult to assess. To date, no existing study has described variation in school-level pregnancy norms across high schools in the United States. Our primary goal is to provide an exploratory picture of the range of school-based norms about pregnancy across U.S. high schools. We argue that multiple group-level characteristics of norms are crucial to capture. Both the *strength* of a group's norm against teen pregnancy and *consensus* in the group about the norm are likely to have important implications for regulating behavior. Improving on past research, we measure both of these dimensions at the school level.

We address four research questions: (1) How is the average strength of a school-level norm against teen pregnancy related to the level of consensus about that school-level norm? (2) How are norm strength and consensus associated with schools' prevalence of teen pregnancy? (3) How is the racial, socioeconomic, and religious composition of a school related to teen pregnancy norm strength and consensus? (4) Do normative differences explain the associations between school racial, socioeconomic, and religious composition and school pregnancy prevalence?

Social contexts and adolescent sexuality

Large literatures have examined the relationship between racial/ethnic and socioeconomic disadvantage in teens' social contexts and their sexual attitudes and behaviors. The bulk of

this work has focused on neighborhoods rather than schools. For example, Browning and colleagues have found that race/ethnicity and neighborhood-level concentrated poverty shape teens' risk of early sexual debut and attitudes about sex and pregnancy (Browning and Bunting 2006; Browning, Leventhal, and Brooks-Gunn 2004). Similarly, neighborhood poverty and socioeconomic status are related to teens' sexual behavior and women's family formation (Billy, Brewster, and Grady 1994; Brewster 1994a, 1994b; Harding 2003; South and Crowder 1999). Some of this research has inferred—but not documented—that neighborhood disadvantage shapes teens' sexual attitudes and behaviors through group-level norms (e.g., Brewster 1994a; Sucoff and Upchurch 1998). Supporting this idea, collective efficacy at the neighborhood level has been linked to both neighborhood disadvantage and teens' behaviors (Browning, Leventhal, and Brooks-Gunn 2005; Browning et al. 2008; Sampson, Raudenbush, and Earls 1997). Although it has not been linked directly to sexual behavior, a neighborhood's concentrated poverty predicts its residents' tolerance of deviance among teens, which should have implications for sexuality norms (Sampson and Bartusch 1998).

Schools and teen pregnancy norms

Despite the literature's emphasis on neighborhoods, Teitler and Weiss (2000) found that schools are the more important influence on teens' sexual behavior. U.S. high schools are often fairly cohesive social contexts with their own cultures (DiMaggio 1982), but very little research on teen pregnancy has examined norms and norm consensus using schools as the backdrop. Although high schools are composed of smaller peer networks whose norms may either echo or conflict with the school's overarching normative context (Eckert 1989; Pascoe 2007), and although schools are just one of many social contexts in adolescent's lives (e.g., neighborhoods, families, and friends), schools remain a fundamental component of adolescents' norm reference systems. Teitler and Weiss (2000) have advocated for greater attention to school-level normative environments for understanding teenagers' sexual behaviors, but little research has responded to this call.

Norms about teen pregnancy belong to a special subset of social norms, called age norms, which are fundamental to the interdisciplinary life course theoretical perspective (Neugarten, Moore, and Lowe 1965). As part of a “prescriptive timetable for major life events” (Neugarten et al. 1965, 711), age norms are shared expectations about when and in which order it is appropriate for people to make particular life transitions (Settersten 2004). In this case, there is a shared societal expectation that teenagers should not get pregnant (Mollborn 2009). If a teen gets pregnant, she is vulnerable to negative interpersonal and institutional sanctions. Life course researchers have called for more research documenting age norms (Macmillan 2007; Marini 1984; Settersten 2004). Despite sociologists' acknowledgement that age norms are a group-level construct, past research has primarily focused on individual-level measures of norms (e.g., Billari and Liefbroer 2007; Settersten 1998). The individual-level approach reflects the influential “theory of reasoned action” in psychology (Ajzen and Fishbein 1980), in which group members' norms influence individuals' behavior through the individual's subjective (or internalized) norm. By neglecting group-level processes, this analytical decision rules out the possibility of studying inherently group-level

aspects of norms, such as the group-level normative heterogeneity that Harding (2007) finds to be an important way in which contextual disadvantage can shape behavior.

Following past research from across the social sciences and related fields (Elster 1989; Goffman 1967; Keltner and Buswell 1997; Staller and Petta 2001; Wooten 2006), we measure social norms by aggregating student respondents' sense of embarrassment regarding the possibility that they may become pregnant (or impregnate someone). Embarrassment is a social emotion that is generated by the actual or imagined presence of others (Berthoz et al. 2002). Therefore, it provides a convenient method to assess a person's perceptions that she may be violating behavioral expectations, and it is in line with traditional sociological definitions of norms (Cooley 1902). As an informal social sanction, embarrassment regulates behavior (Keltner and Buswell 1997; Staller and Petta 2001). Vasalou, Joinson, and Pitt (2006) found that feeling embarrassment, shame, and guilt increased adherence to a social norm, and Mollborn (2010) found that embarrassment at the prospect of a teenage pregnancy strongly decreased the likelihood of a teen subsequently getting pregnant.

Measuring norms (a group-level phenomenon) as a quantitative trait is notoriously difficult because the bulk of quantitative social science data involve individual-level data collection instruments (Marini 1984; Settersten 2004). However, we argue that when data are collected from multiple respondents within known social clusters (such as schools), the aggregation of responses regarding embarrassment is more than the sum of its parts. This kind of data provides researchers with a unique opportunity to indirectly assess the strength of the norm (the mean) and consensus about the norm (the variance), which are distinct and meaningful group-level constructs (Jessor et al. 1968). Accordingly, the *average* level of embarrassment reported by students at the prospect of a teen pregnancy indicates how strong the norm against teen pregnancy typically is at a school. There are likely to be palpable differences in terms of the negative sanctions experienced by pregnant students attending a school in which students report on average that they would be embarrassed if they got pregnant (or got a girl pregnant), compared to a school in which students do not think a pregnancy would be embarrassing. This stronger norm should regulate its target behavior by reducing pregnancy. Therefore, we hypothesize that schools with stronger norms against teen pregnancy will be characterized by a lower prevalence of pregnancy.

Because subsequent waves of the Add Health survey followed students and not schools, we relied on concurrent measures of school-level normative climates and pregnancy prevalence. The causal relationship between the two is almost certainly bidirectional and mediated by other factors. For example, schools with weaker norms against teen pregnancy may be more likely to establish programs that help pregnant and parenting teens stay in school, such as in-school child care centers. As those teen parents stay in school instead of dropping out, their presumably weaker norms against teen pregnancy may further contribute to the school's more permissive normative climate. We explore this issue further in the discussion section.

We also contribute to the literature by characterizing the level of *consensus* about a school-level teen pregnancy norm. Consensus around the norm is likely related to group cohesiveness at the school level, as well as cohesiveness in the larger community from which the school draws its students. Lack of consensus regarding normative behavior within

a group is most closely aligned with Durkheim's (1951 [1897]) notion of anomie, and others have argued that social contexts with large variation around a norm are more likely to have adverse outcomes such as teen pregnancy because of the lower ability of such contexts to regulate behavior (Jessor et al. 1968). Therefore, we also calculate the variance in the embarrassment response to assess how broadly distributed students' responses are at a particular school. This approach to operationalizing cultural heterogeneity echoes Harding's (2007, 2011) work about neighborhood effects on teens' sexual and educational behaviors. He asserts that when "there are multiple cultural models available" (2007:345), teens' behavior is more weakly regulated. Studying college aspirations and enrollment, Harding (2011) measured neighborhood-level mean levels of and consensus around college aspirations. This latter measure is an operationalization of cultural heterogeneity in teenagers' social contexts.

We hypothesize that there should be a negative relationship between norm strength and pregnancy prevalence in higher-consensus, but not lower-consensus, schools. These ideas stem from the social psychological literature, which finds that individuals are more likely to align their behavior with and enforce an existing norm when the norm is strongly held and supported by a general consensus in the group (Hechter 1987; Horne 2001). Strong norms against teen pregnancy may regulate behavior particularly strictly, as evidenced by low teen pregnancy prevalence in the school, when there is high consensus about the norm. Consider two strong-norm high schools whose students, on average, agree that they are embarrassed by the prospect of experiencing a teen pregnancy. The first school has a low variance, suggesting strong consensus among its students in this norm against teen pregnancy. A pregnant teen at this school is likely to face nearly unified negative reactions. The second school has a high variance around the mean: Many students report a norm that is different than their school's average norm. In a school like this, there may be different subpopulations within the school that hold strongly divergent norms about teen pregnancy, or there may be general anomie among the students with widespread disagreement about the norm. In either case, a pregnant teen in this school should find that many peers do not disapprove of her situation. Therefore, schools with both a strong norm against teen pregnancy and strong consensus about the norm should be the most effective at regulating the target behavior. Supporting this notion, Harding (2007) found that frames and scripts for teens' sexual behavior were less predictive of teens' actual behaviors in neighborhoods with lower consensus (greater heterogeneity) about these frames and scripts.

Sources of variation in school-level teen pregnancy norms

Past research has made it clear that norms about teen pregnancy vary in the U.S. population (Edin and Kefalas 2005; Mollborn 2009, 2010). Based on previous literature, three factors appear to be particularly important in understanding this variation: race/ethnicity, socioeconomic status (SES), and religion. We review each in turn.

Race

Echoing qualitative research on the topic (Anderson 1990; Burton 1990), quantitative research has documented differences between African Americans and whites in adults' and teenagers' perceived norms about teen pregnancy (Mollborn 2009, 2010). Other racial/ethnic

groups have not evidenced significant differences from whites after adjusting for socioeconomic differences across the groups. Explanations that scholars have proffered for these norm differences, such as Burton's (1990) qualitative analysis of a low-income Black community's welcoming of motherhood as an achievement of adult status, or Anderson's (1990) description of changing norms caused by shared experiences of social isolation in poor African American neighborhoods, tend to incorporate cultural, structural, or hybrid explanations. In support of structural explanations, initial differences by neighborhood racial composition were fully accounted for by neighborhood socioeconomic disadvantage (Mollborn 2010).

Socioeconomic status (SES) and inequality

Stronger norms against nonmarital teen pregnancy have been documented among more highly educated Americans (Mollborn 2009) and in higher-SES neighborhoods (Mollborn 2010), but research has not examined school-level socioeconomic status. Students' and school staff members' shared evaluation of the costs and benefits of different options available to teens likely varies by schools' socioeconomic composition. When opportunities for socioeconomic advancement are plentiful, school norms may discourage teenagers from getting pregnant. In contrast, when future socioeconomic prospects are dim, teens may have little incentive to delay childbearing (Wilson 1987). Harding (2007) found that disadvantaged neighborhoods had more heterogeneous scripts and frames for teen sexual behavior, suggesting that lower socioeconomic status may also be associated with weaker consensus about teen pregnancy norms.

We also consider *socioeconomic inequality* at the school level. As others have shown (Boardman et al. 2012), schools with high levels of inequality have varying degrees of opportunity available for their students, which may affect the likelihood that two people will befriend one another. These schools are also likely to have segregated friendship networks that may result in divergent social norms (McPherson and Smith-Lovin 1987). For both of these reasons, there may be less consensus about the appropriateness of teenage pregnancy in schools with greater socioeconomic inequality.

Religion

Religious individuals tend to have stronger proscriptions regarding aspects of sexuality including pornography (Sherkat and Ellison 1997), family planning (Ellison and Goodson 1997), and specific gender roles (Bartkowski and Hempel 2009) that may influence group norms regarding teen pregnancy. Many private schools are run by religious organizations, and although laws formalize their separation, public schools have varying levels of involvement with religious groups in their communities. As such, school norms may be shaped by the religious composition of the students and communities that they serve. Different constructs have been used to operationalize religion. Because we are interested in normative aspects related to religiosity, we gauge the religious context of the school by assessing the degree of belief in scriptural inerrancy, which is common within evangelical and fundamentalist religious organizations and is a critical cultural component of religious identity (Hunter 1981). Scriptural inerrancy is the view that the respondent's religion's scripture is "God's word of truth to mankind, is entirely unmistakable in its statements and

teachings” (as quoted in Hunter 1981, 368). Efforts have been made to refine this measure, especially as it relates to differences among evangelical and fundamentalist Christians (Ammerman 1982), but it remains a central measure of cultural aspects related to religiosity. Because religious scriptures generally proscribe sex before marriage, higher levels of belief in scriptural inerrancy are expected to predict stronger norms against teen pregnancy and greater consensus—though Stark (1996) has found that this relationship holds only when the larger group is religious.

Disentangling influences

Racial, socioeconomic, and to a lesser extent, religious factors are probably confounded at the school level. Both individual- and school-level socioeconomic status are highly correlated with race and ethnicity, with African Americans more disadvantaged than many other groups (Brewster 1994b). African Americans also report higher average levels of religiosity, religious service attendance, and involvement in evangelical religious organizations than other racial/ethnic groups (Ellison 1998). In addition, religion and socioeconomic status can easily be confounded because of higher levels of religious involvement among lower-SES groups (Sherkat 2007). Our analyses work to disentangle the associations of each of these interrelated factors with the strength of and consensus about teen pregnancy norms within schools.

Method

Data

This study uses data from the National Longitudinal Study of Adolescent Health (Add Health) (Harris 2009; Harris et al. 2009). Add Health was designed to examine health and health-related behaviors among a nationally representative sample of adolescents in seventh through twelfth grade. In 1994, 90,118 adolescents from 134 schools completed questionnaires about their daily activities, health-related behaviors, and basic social and demographic characteristics. Following the in-school survey, 20,747 respondents were re-interviewed in their homes between April and December of 1995. We limited our analysis to high schools (dropping middle schools and junior high schools because students under age 15 were usually not asked our central questions about sexuality and pregnancy) and to schools in which at least 25 students responded to the questions (to ensure reliable estimates of the mean and variance). In total, our final sample contained 75 schools. Compared to the 107 schools that had students who met our age requirement in the full sample our sample schools contained more White students and fewer Hispanic students (those schools which were not included had 4% fewer White students and 4% more Hispanic students). There were slight (less than 1%) differences in the percentages of the Asian and Black students between the sample and non-sample schools. The difference between sample and non-sample schools in percentage of students whose mothers had at least attended college was also 1%. As such, we are confident that our reduced sample is reasonably representative of the overall sample of high schools from the Add Health study.

Measures

Teen pregnancy norms—During the Wave I in-home survey, male respondents were asked to respond to the following statement: “If you got someone pregnant, it would be embarrassing for you.” Female respondents were asked to respond to: “If you got pregnant, it would be embarrassing for you.” Response options ranged from 1 (“Strongly agree”) to 5 (“Strongly disagree”). We calculated the average and variance of these responses for each of the schools in the study. Of the 75 schools in our final sample, the minimum number of responses per school was 27 and the maximum was 1,226 (average = 146; median = 110). In total, our school-based measures relied on 8,764 respondents. We then reverse coded the responses so that the minimum value of 0 corresponded with the value of the school with the weakest average norm about teen pregnancy (which in the original metric was 1.27, between “disagree” and “neither agree nor disagree”). The school with the strongest norm, at 2.38 points higher, had an average between “agree” and “strongly agree.” We used these values to compute the school-level variances, our measure of the school consensus about the school pregnancy norm. Higher variances thus represent greater levels of school-level dissensus about the pregnancy norm.

Prevalence of teen pregnancy—School-level pregnancy prevalence was assessed by computing the percentage of female students from the In-Home Wave I sample who reported having ever been pregnant. Since pregnant students may drop out or switch schools, these percentages are likely to be underestimates of the percentage of female students who have ever been pregnant while attending each school.

Other independent variables—The other key school-level variables of interest were racial composition, socioeconomic composition, and religious composition. The racial composition calculated the proportion of the school that is non-Hispanic and Black. Mollborn (2010) found that individual-level norms regarding pregnancy differed markedly for Blacks and Hispanics compared to non-Hispanic whites, but the Hispanic-white differences were explained by socioeconomic differences. In addition, the correlation between the Black and Hispanic school composition measures was quite high, and their simultaneous inclusion in the models made it difficult to interpret the multivariate results. As such, we only included a control for the proportion of students in the school who were non-Hispanic and Black.

We assessed the socioeconomic composition of the school with a measure that tapped the proportion of students whose mother had obtained a college degree or higher. Given the influence of socioeconomic inequality on the development and enforcement of norms, we also measured socioeconomic inequality using a Gini coefficient based on the distribution of maternal education within the schools. The maternal education variable was coded based upon student-reported levels of maternal education (e.g., finished 8th grade, dropped out of high school, attended college, etc.). Using this coding, we estimated Gini coefficients at each school where the estimates describe the mismatch between the expected cumulative distribution of education and the observed distribution (Lorenz Curve), ranging from 0 (perfect equality) to 1 (perfect inequality). Finally, given the strong association between religiosity and teen pregnancy, we also included a measure that tapped the proportion of the

student body who agreed that “the sacred scriptures of your religion are the word of God and are completely without any mistakes.” We used the proportion of “yes” responses for all students in the school to tap scriptural inerrancy beliefs.

Analysis Plan

Descriptive analyses first showed the associations among schools' norm strength and consensus, pregnancy prevalence, and other predictors. Multivariate regression analyses assessed the association of school racial composition with norm strength and consensus, then added socioeconomic status and inequality to investigate whether they explained part of the influence of racial composition. We then included school religious context to explore whether it accounted for the remaining racial or socioeconomic influences. Additional analyses predicting school-level pregnancy prevalence introduced measures of norm strength and consensus to test whether differences in school normative climates accounted for any significant associations between pregnancy prevalence and race, SES, or religion. Finally, we examined the hypothesized interaction between norm strength and consensus in predicting teen pregnancy prevalence.

Results

The bivariate correlations for the three pregnancy-related measures and the compositional measures are provided in Table 1 and graphically in Figure 1. Overall, norm strength and norm dissensus (the school-level mean and variance of embarrassment) were negatively and strongly correlated ($r = -0.72$), as shown in Figure 1. That is, as norms against pregnancy strengthened, consensus about the norm increased. The fact that schools with extreme norms have lower variances, shown in the upper left panel of Figure 1, is due in part to the limited range of the norm. Schools with means near the bounds of this variable necessarily had quite limited variability in students' responses. Importantly, this panel in Figure 1 shows that despite the strong association, there remained variation in consensus about the norm (i.e., the variance) across schools that had fairly comparable mean norm levels. This distinction is important because norm strength ($r = -0.65$) and dissensus about the norm ($r = 0.34$) were both strongly associated with the actual pregnancy prevalence within the school at Wave I (see Table 1 and the right-hand side of Figure 1). As expected, schools with the strongest norms against pregnancy had the lowest prevalence of pregnancy, and schools with the least amount of consensus regarding the norm had some of the highest prevalence of teen pregnancy.

Racial composition was strongly associated with the pregnancy norm strength in the direction expected. Schools with higher proportions of Black students tended to have weaker mean norms about teen pregnancy ($r = -0.48$) and greater dissensus ($r = 0.26$) about the norms. Racial composition ($r = 0.53$) was strongly associated with school pregnancy prevalence at Wave I, but socioeconomic composition ($r = -0.17$) was not significantly correlated with pregnancy outcomes for the schools. Socioeconomic inequality within schools was the most highly correlated with both the mean norm ($r = -0.53$) and dissensus about the norm ($r = 0.59$) of any predictor in Table 1, with higher inequality linked to weaker norms and greater dissensus as expected. Socioeconomic inequality was not

significantly correlated with school pregnancy prevalence ($r = 0.17$). Finally, it is quite interesting that the school-level prevalence of beliefs about scriptural inerrancy was not correlated with norms regarding pregnancy. Schools with a higher proportion of students who believed that religious texts are the “word of god” perhaps surprisingly had higher prevalence of pregnancy ($r = 0.23$), but the mechanism for this association did not appear to be strength or consensus in the shared perception of embarrassment (e.g., normative factors) regarding teen pregnancy.

Given the strong bivariate associations between the compositional measures, the ordinary least squares regression results displayed in Tables 2a and 2b attempted to clarify the nature of the observed associations between the racial, socioeconomic, and religious composition of schools and the strength of norms regarding teen pregnancy, as well as consensus about this norm. The first model in Table 2a presents the bivariate association between percent Black and norm strength. Controlling for socioeconomic composition did not weaken the observed association, suggesting that racial composition is linked to the strength of norms against pregnancy above and beyond the significant compositional differences in socioeconomic status. Inequality in schools (Model 3a) was negatively associated with norm strength and accounted for roughly one half of the association between school socioeconomic composition (as measured by maternal education) and norm strength, but did little to account for the link between racial composition and norm strength. Finally, controlling for scriptural inerrancy beliefs in Model 4a did not account for the observed racial or socioeconomic differences in pregnancy-related norm strength. Interestingly, while there was no bivariate association between religion and norm strength, adjusting for the sociodemographic composition of schools revealed a suppressor effect: Inerrancy beliefs were positively linked to the strength of norms against pregnancy in the multivariate model. This is most likely due to the correlation between the percent Black and inerrancy ($r = 0.33$), which is also indicated by the suppressor effect for the racial composition variable that increased from $b = -0.89$ to -1.12 after introducing inerrancy beliefs. That is, once we accounted for the fact that more predominantly Black schools had a higher proportion of students who believed that holy scriptures are the word of god, predominantly Black schools became more likely to be characterized as having weaker norms against teen pregnancy than schools with fewer Black students. In Model 4a, the influence of racial composition remained nearly twice as strong (as indicated by the standardized regression estimates) as any of the other predictors.

Comparable associations are also shown for norm dissensus in Table 2b. Schools with higher proportions of Black students had lower consensus (greater variation) about norms against teen pregnancy. Subsequent models show that this association was robust to differences with respect to socioeconomic composition, socioeconomic inequality, and scriptural inerrancy. In contrast to norm strength (standardized beta = -0.63), the association of racial composition with norm consensus was notably smaller in magnitude (standardized beta = 0.38). This is important because it suggests that the strength and consensus measures, despite their bivariate correlation, are capturing different aspects of the norm rather than a single latent construct.

Multivariate regression models predicting school-level pregnancy prevalence on the basis of norm strength and norm consensus are shown in Table 3. Model 3b presents the associations between racial, socioeconomic, and religious predictors and teen pregnancy prevalence with each of the other factors controlled. In contrast to the bivariate correlations, when all of these factors were included in the same regression model, socioeconomic composition and inequality and scriptural inerrancy were not associated with teen pregnancy prevalence. Schools with higher proportions of non-Hispanic Black students still had significantly higher pregnancy prevalence when socioeconomic and religious factors were controlled. Model 3a shows that the strength of this association was the same when the socioeconomic and religious measures were removed to retain statistical power. Model 3c added the school-level normative climate measures. As with the bivariate models, stronger norms against pregnancy (higher mean levels of embarrassment) at the school level negatively predicted school pregnancy prevalence. Consensus about the norm was not associated with teen pregnancy prevalence after controlling for the mean level of the norm. Importantly, the coefficient for the racial composition of the school declined by nearly 50% after controlling for normative climate, suggesting that normative differences across schools accounted for a sizable amount of the observed racial differences in teen pregnancy prevalence. When comparing the standardized regression estimates, the average strength of students' embarrassment at the prospect of a teen pregnancy (standardized beta = -0.67) was roughly three times more important for predicting school pregnancy prevalence than was the racial composition (standardized beta = 0.27) of the school.

We also expected to find that schools with both stronger norms against pregnancy and higher consensus would have lower levels of teen pregnancy; in other words, norm strength and consensus about the norm may interact in predicting teen pregnancy prevalence. To examine this, Model 3d included an interaction between the school-level norm strength and consensus, which Table 1 showed were strongly correlated ($r = -0.72$). As such, interacting the two factors presented statistical as well as substantive challenges. Given the limited variability in norm consensus at the highest and lowest average levels of pregnancy norm, we restricted the interactive analysis to the 38 schools that fell within the interquartile range (IQR) for the norm. These schools had greater variation of norm consensus at a particular norm level, so we could test the interaction. As shown in Model 3d, this interaction was statistically significant and positive. Figure 2 aids in interpretation of the interaction by plotting predicted school pregnancy prevalence based on this regression model, by norm strength and consensus. Schools with norm consensus below the median (the circles) did not have different pregnancy prevalence as norm strength increased (the dashed line). In contrast, there was a negative relationship (the solid line) between norm strength and pregnancy prevalence in schools whose norm consensus was above the median (the triangles). When norms against teen pregnancy were weak, pregnancy prevalence was similar for low- and high-consensus schools. But when norms were stronger and consensus about the norm was high, pregnancy prevalence was only half as high as for lower-consensus schools at the same norm strength. In other words, among typical schools (those within the IQR of pregnancy norms), norm strength must be coupled with norm consensus to best predict school-level pregnancy prevalence. This finding supports our hypothesis and

suggests that normative climates with strong consensus about a norm that clearly proscribes teen pregnancy have the lowest prevalence of the target behavior.

Discussion

Grappling with struggles over sex education, the availability of contraception, and the types of dancing permitted at school events, schools continue to be battlegrounds for the communication of social norms regarding sexuality and reproduction for teenagers (Fields 2008; Luttrell 2003). An underlying assumption in these debates is that the norms about teen sexuality and pregnancy communicated in schools matter. More traditional conceptualizations of norms expect them to shape *motives* for engaging in behaviors, while newer approaches focus on how culture provides the *means* for justifying one's own behavior (Swidler 2001; Vaisey 2010). Yet research has not captured group-level normative processes related to teen pregnancy: variation in the strength of school-level norms about teen pregnancy, the degree of consensus about these norms within a school, or compositional factors that may be related to teen pregnancy norms. And no existing work has linked these important factors to differences in pregnancy prevalence across schools. Because our data are cross-sectional, we cannot take sides in the debate between norms as motives versus means (Vaisey 2010). Rather, norms may be operating in either or both of these ways. In our study, norm strength and consensus may have shaped teenagers' motivations for avoiding pregnancy and thereby school-level teen pregnancy prevalence. Instead or in addition, norms may have affected the content of the cultural repertoire (Swidler 2001) that shapes available options for people who engage in a behavior, making it difficult for teens who experience pregnancy in some normative contexts to stay in their school without being socially excluded—which would also shape school-level teen pregnancy prevalence.

This paper made three primary contributions to this literature. First, we characterized norms about teen pregnancy at the level of the school, a social context that looms large in teens' lives and provides many of the social norms that shape their behavior (Teitler and Weiss 2000). Because norms are a group-level construct, measuring them at the level of this influential social context is an important step. Our results found a surprising amount of variation across schools with respect to the strength of norms against teen pregnancy among students. To get a better sense of this variation, we also calculated the proportion of students who agreed or strongly agreed that they would be embarrassed about a pregnancy. This distribution had first, second, and third quartiles of 56%, 62%, and 72% who agreed or strongly agreed, respectively. In the fifth percentile, only one in three students expressed embarrassment at the prospect of a pregnancy, but in the 95th percentile nearly nine in ten expressed this same feeling. While high schools are often discussed as a shared social context, it is quite clear that norms regarding this important issue differed markedly from school to school. Focusing on these normative differences may offer additional insight into other areas of research at the intersection of education and families, such as the ability of schools to integrate diverse populations (such as special education, linguistic minority, or sexual minority students) into their broader academic communities or understanding teens' decisions to use drugs, alcohol, and tobacco.

Second, this study went beyond measuring average norm strength to also consider the degree of consensus about schools' norms. Social scientists expect that norms need to be widely shared in order to strongly influence individuals' behavior, so a school's average norm may be meaningless if there is little consensus about the norm within the school. As with the distribution of the mean, the distribution of school-specific variances regarding pregnancy also indicated differences across schools with respect to the normative context. Schools with strong average norms against teen pregnancy and a high degree of consensus about the norm had by far the lowest prevalence of pregnancy. These findings point to an important opportunity for future researchers because accounting for the source and structure of this variation may give important clues about social and institutional (e.g., tracking) networks in which students find themselves. In other words, if norm consensus is near perfect within social cliques or groups of students but large variation is evident within the school, then it suggests that socialization regarding sexuality and parenting is happening among peer groups rather than in the broader school environment. And, past research suggests that there may be important aspects of schools that directly or indirectly support this type of bifurcated socialization within their halls (Moody 2001). This paper demonstrates the usefulness of this concept, but our ongoing research (Mollborn, Domingue, and Boardman 2014) is identifying within-school (in addition to between-school as we have done here) sources of the complex process of pregnancy socialization and their relationships to individual-level behaviors.

Third, we provided a broad overview of the ways in which the socioeconomic and racial composition of schools were related to teen pregnancy prevalence and the ways in which normative factors helped to account for some of these influences. We estimated that schools without any non-Hispanic Black students could expect a pregnancy prevalence of roughly 4%, compared to 16% among schools with all non-Hispanic Black students. This relationship between racial composition and school pregnancy prevalence was not affected by socioeconomic or religious factors that varied across the schools, but it was cut in half once normative factors across schools were considered. Our findings make an important statement about the role of shared understandings of teen pregnancy that may differ among racial groups and the way in which these factors may influence teen pregnancy prevalence. But again, as shown in Table 3, normative factors related to teen pregnancy were much more important than racial composition for predicting schools' teen pregnancy prevalence. The normative environment remains an important component of racial differences in teen pregnancy prevalence but, as clearly shown in Figure 1, this is not a factor that is unique to predominantly Black schools by any means, nor does it come close to fully explaining these differences.

Several limitations of the study should be noted when interpreting the results of our research. First, it is important for future researchers to consider other social contexts besides schools. Add Health included a question about family embarrassment at the prospect of a pregnancy, but its high correlation with individual embarrassment ruled it out for analysis. Neighborhoods (i.e., census tracts) did not contain enough respondents to aggregate for our analysis. Thus, we cannot speak to the importance of schools compared to other broad social contexts, but our findings do suggest that school norms are an interesting focus for research. This emphasis is particularly important when one considers the role of peer networks and

social groups that form within rather than between schools. If norm consensus is near perfect within social cliques or groups of students but large variation is evident within the school, then it suggests that socialization regarding sexuality and parenting is happening among peer groups more than in the broader school environment. Past research suggests there may be important aspects of schools that directly or indirectly facilitate or prevent this type of normative climate (Moody 2001).

To examine the possibility that peer networks are more important for pregnancy norms than schools, we estimated models comparable to Tables 2a, 2b, and 3 that included detailed information about the different types of network structures that exist across the schools in the Add Health study. These measures included information on the *school-level network centrality and density*. Network centrality measures the extent to which most ties within a network go through a limited number of persons. Therefore, school-level differences in centrality describe a range of social network typologies from highly organized top-down networks, to highly atomized and insular networks. Density measures the number of ties that an individual has as a function of the total number of possible ties. These two indicators were positively correlated ($r=.37$, $p<.01$), but there were enough differences across schools to consider the influence of centrality and density as partially independent. We analyzed other measures such as the standard deviation of these measures as well as the mean and standard deviation of the indegree (network size), but they were all highly collinear with the other indicators of school network structure. We also explored the possibility that *race, gender, and grade denote key friendship sorting mechanisms* that vary across schools. As described elsewhere (Moody 2001), these measures relied on Freeman's (1972) method to compare the likelihood of same-race friendships to the racial composition of the school (the same can be done with gender and grade). The most highly correlated indicators were sex-based segregation and centrality ($r = -.51$, $p<.001$) and sex segregation and grade segregation ($r=.51$, $p<.001$), but the remaining network indicators were only moderately associated with one another (and most independent from one another). These results are presented in Appendix 1.

Network measures with significant associations were then included in each respective regression model. These results are presented in Appendix 2. Three different models were estimated for each of the three full models from Table 2a (Model 4a), Table 2b (Model 4b), and Table 3 (Model 3d). For example, the value in the upper left cell of Appendix 2 corresponds to the same value reported in Table 2b, Model 4b for all 75 schools in our analyses. Model 2 in this series reduced the school sample to those with complete network data ($n=69$ schools), and Model 3 controlled for the network measures. Change in a coefficient from Model 2 to Model 3 would suggest that network structure and sample selection influenced our results. The most important observation is that while there was a slight decline in the magnitude of the parameter estimates, the results remained substantively quite similar to our original results in direction and significance. The most salient network measure to emerge in these results was gender segregation with respect to friendships. Schools with greater than expected same-sex friendships had higher levels of embarrassment compared to other schools. While not the focus of this paper, this finding is worth examining in future research. In Table 2b, Model 3, grade segregation was negatively associated with

norm dissensus: In schools with more friendships occurring among those from the same grade, there was greater consensus regarding pregnancy norms.

The racial and educational composition coefficients were both reduced substantially after introducing the friendship network controls. This suggests that some of the effects of school-level SES on norm levels and norm consensus may operate through network structures that may be different for schools with different socioeconomic compositions. In the case of embarrassment dissensus, the maternal education coefficient was reduced by nearly 1/2, and the p-value fell below a traditional level of significance ($p < .07$). This suggests that socioeconomic status and racial composition of schools may be linked to norm consensus within schools through differences in network structures across the schools; schools with higher socioeconomic statuses may also have more tightly structured and top-down social network systems, which leads to greater consensus in norms about pregnancy. Similarly, school-level network centrality ($b = 3.08$, $p < .001$) was negatively associated with the percent of students who were black ($r = -.40$, $p < .001$), and the inclusion of this and other network variables reduced the racial composition coefficient by more than one half. Taken together, our key findings about school-level pregnancy norms and norm consensus were relatively robust to network differences across schools, and we conclude that school-level pregnancy norms are an important phenomenon to study.

Second, readers should note that we relied exclusively on cross-sectional data from Wave I of Add Health, which limits our ability to make causal and mediational claims. We have established relationships among school-level demographic characteristics, teen pregnancy norms, and pregnancy rates, but there is still the possibility of reverse causality; norms may simply mirror the rates of pregnancy. Another concern is selection: Students whose norms differ from those of their school may be more likely to drop out over time, thus not contributing to the school-level norm measure. Although longitudinal school-level data would address this, Add Health is not a strong data source for this purpose. The Wave II sample excluded graduating seniors from Wave I, so it is difficult to examine change in the school context and change in teen pregnancy rates because of the different composition of respondents. Nor are there available alternatives: No other dataset has a large enough sample of schools to permit analysis of variation in school-level norms, but future data collection efforts should try to facilitate this. Nevertheless, it is possible to use the longitudinal nature of the data to evaluate the extent to which this may bias our estimates. Specifically, we calculated the change in pregnancy prevalence from Wave I to Wave II, as well as the school's dropout prevalence. Because pregnancy prevalence is likely to be fairly consistent in a 9-month window, it is likely that the observed changes in pregnancy rates provide crude evidence that the composition of those who responded to the survey changed, in part, because of pregnancies at the school. These measures were included as controls in the Appendix tables. As with the introduction of friendship network measures, our substantive conclusions remained unchanged after including these new controls. The dropout prevalence was not associated with norm mean or consensus in the regression models but, as with the bivariate association ($r = .59$, $p < .001$), we did find that change in pregnancy rates across waves was positively associated with the Wave I mean pregnancy norm ($b = .13$, $p < .001$). This provides some support for our concern for selection of students as a function of pregnancy status but, again, this adjustment did not change our conclusions.

Third, readers should consider that the Add Health in-school surveys were conducted in 1995. Although the early 1990s were the recent high-water mark for teen pregnancy rates (Martin et al. 2012), norms about teen pregnancy may or may not be different today than they were when the data were collected, and future research should use more recent data. Yet teen sex, pregnancy, and abortion are still contentious and highly relevant social issues today. Similarly, Add Health's only available norm question captured teen pregnancy, so we could not measure related norms about teen sex, contraception, and abortion as future research should do. We argue that embarrassment at the prospect of a (public) pregnancy inherently involves embarrassment about the behaviors that precede it—heterosexual intercourse, contraception, and abortion—so these norms are captured to some extent in our analyses.

Finally, there are limitations in the way in which we operationalized and measured some of the social and economic domains. We used only maternal education to represent socioeconomic status, racial composition is measured with percent black rather than other more detailed measurements, religiosity is only measured with scriptural inerrancy, and we do not differentiate between private, public, and religious schools. In a series of additional sensitivity analyses (results available upon request), we made important changes to the measures that included school-level measures of: a) highest year of education for either parent, b) income-to-needs ratio, c) attending a religious school, d) the proportion of mothers in the school who were teen mothers themselves, and e) the overall sense of school attachment. In all cases, the inclusion of these additional controls did not change our findings or affect our conclusions. Similarly, we also weighted our school values by the size of the school and the natural log of the school size. These models were nearly identical to our results. As such, there may be several important factors that contribute to the development and enforcement of teen norms about pregnancy, but we are confident that our results are robust to these potentially confounding factors.

Given the results of this study, we encourage researchers to examine the social mechanisms through which norms may translate to behaviors. Specifically, social scientists using a traditional conceptualization expect norms to regulate the behavior they target (Jessor et al. 1968; Vaisey 2010). Indeed, research analyzing individual-level perceived norms against teen pregnancy found a robust relationship between teens' perceived norms against teen pregnancy and their subsequent likelihood of experiencing a teen pregnancy themselves (Mollborn 2010). And we showed that schools with stronger norms against teen pregnancy reported lower school-level prevalence of teen pregnancy, but we did not address the meso-level interaction-related factors that may structure this association.

Stronger norms with high consensus should regulate students' behavior, discouraging them from becoming pregnant because of real or perceived costs (or benefits) that students attach to pregnancy. These costs may provide important cues about policies that may be particularly important in specific environments (e.g., as a function of the school norm and consensus about the norm). For example, although federal legislation prevents schools from denying educational access to pregnant and parenting teens, many U.S. schools have found ways of discouraging these teens from attending. Some school districts designate a particular high school to have support programs and child care centers available for pregnant and

parenting teens, which encourages them to move from their prior school to the more supportive school. In this way, the other schools in the district are able to have low enrollments of teenage mothers, making their teen pregnancy prevalence appear low. Therefore, it is possible that schools with stronger norms against teen pregnancy (which typically have more socioeconomic resources, as we have shown) are more likely to mobilize in this and other strategies for lowering their teen pregnancy prevalence. We could not disentangle these mechanisms because of our cross-sectional data, but we encourage future research to consider these possible mechanisms for the associations we describe here.

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Appendix 1

School-level differences in friendship network composition, pregnancy, and dropout rates (N = 69 schools).

	Mean Embarrassment	Dissensus (Variance) Embarrassment	Pregnancy Rate Wave 1
Density	.14	-.18	.01
Centrality	.44 ***	-.15	.24
Segregation			
Sex	.54 ***	-.57 ***	-.42 *
Race	-.14	.18	.34 *
Grade	.17	-.26 *	-.31
Change in Pregnancy	.59 ***	-.54 ***	-.24
Dropout Rate	-.41 ***	.33 ***	.01

Note: cell entries represent bivariate correlation coefficients.

p < .001,

**
p < .01,

*
p < .05

Appendix 2

Sensitivity of main findings due to school-level differences in network composition and possible selection due to school differences in pregnancy rates and dropout (N = 69 schools).

	Table 2a (Model 4a)			Table 2b (Model 4b)			Table 3 (Model 3d)		
	1	2	3	1	2	3	1	2	3
% Black	-1.12***	-1.13***	-0.53***	.59***	0.60***	0.44*	.04	0.04	-0.02
% College ed. +	1.08***	1.09***	0.56*	-.94**	-1.03***	-0.59+			
Gini maternal ed.	-3.45**	-3.66***	-2.83**	3.17**	3.18***	3.19*			
Scriptural inerrancy	0.89***	0.89***	0.56***	-.55**	-0.60***	-0.61**			
Network centrality			3.08***						
Grade segregation						-.87+			
Race segregation									-.43*
Gender segregation			2.24***			-.84			.06+
Change in pregnancy (WII-WI)			0.13***			-0.03			
Dropout prevalence			-0.29			0.36			0.05
Dissensus (variance) embarrassment							-.77*	-0.54*	-0.72*
Mean embarrassment							-.56+	-0.73*	-.54+
Dissensus * Mean embarrassment							.45*	0.43+	0.43*
Constant	1.38***	1.43***	-1.64*	1.46***	1.51***	2.18***	1.00*	0.95*	0.99*
Observations	75	69	69	75	69	69	38	34	34
R-squared	0.66	0.67	0.82	0.52	0.53	0.63	0.25	0.22	0.44

Note: Cell entries represent unstandardized OLS regression estimates from three separate models. The first model denotes the original model presented in the main text of the paper. Model 2 is the same model but with the reduced sample size using only schools with complete network information. Model 3 includes the network measures that were significantly associate with the dependent variable in the bivariate models presented in Appendix 1.

p < .001,
**
p < .01,
*
p < .05,
+
p < .10

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Figure 1.

Social demographic factors linked to pregnancy norms and teen pregnancy prevalence across schools (N = 75 schools).

Note: Data come from Wave 1 of the National Longitudinal Study of Adolescent Health.

Figure 2.

Predicted school-level pregnancy prevalence by norm averages and norm consensus (Wave 1).

Note: Estimates are based on Model 3d of Table 3. Triangles represent schools with high levels of consensus (low variance) and circles represent low levels of consensus (high variance) among schools in the IQR for school norms regarding pregnancy. The values are the observed pregnancy prevalence and the observed school norms. The lines are the predicted value of pregnancy prevalence as a function of school norms. “Low-consensus schools” are above the median variance, and “high-consensus schools” are below it. These analyses are reduced to a total of 38 schools within the IQR for pregnancy norms.

Table 1

Descriptive statistics and bivariate correlations with teen pregnancy norms and behaviors across schools: National Longitudinal Study of Adolescent Health (N = 75).

	Mean	SD	Min	Max	r(mean)	r(variance)	r(pregnancy)
Mean embarrassment	1.37	0.43	0.00	2.38	1.00	-0.72***	-0.65***
Embarrassment dissensus (variance)	1.59	0.37	0.51	2.24	-0.72***	1.00	0.34**
Pregnancy prevalence	0.06	0.05	0.00	0.34	-0.65***	0.34**	1.00
Percent non-Hispanic Black	0.19	0.24	0.00	0.97	-0.48***	0.26*	0.53***
Percent college ed. mothers	0.38	0.15	0.11	0.90	0.51***	-0.58***	-0.17
GINI coefficient for maternal ed.	0.23	0.04	0.08	0.36	-0.53***	0.59***	0.17
Percent scriptural inerrancy	0.67	0.17	0.21	1.00	-0.04	0.07	0.23*

Note: Data come from Wave I of the National Longitudinal Study of Adolescent Health. Individual responses from the in-home survey were aggregated by school (N = 75 schools). Descriptions for each variable can be found in the text.

*** p<.001,

** p<.01,

* p<.05

Table 2a

Sociodemographic predictors of average school-level norms against teen pregnancy.

	1a	2a	3a	4a	Std. B
Percent black	-0.85*** (0.18)	-0.91*** (0.15)	-0.89*** (0.14)	-1.12*** (0.13)	-.63
Percent coll. ed.+		1.52*** (0.23)	0.89** (0.33)	1.08*** (0.30)	.39
GINI for coll. ed.			-2.97* (1.20)	-3.45** (1.06)	-.34
Scriptural inerrancy				0.89*** (0.19)	.36
Constant	1.53*** (0.06)	0.96*** (0.10)	1.89*** (0.39)	1.38*** (0.36)	
R-squared	0.23	0.52	0.56	0.66	

Table 2b. Social demographic predictors of school-level dissensus (variance) in norms against teen pregnancy.

	1b	2b	3b	4b	Std. B
Percent black	0.41* (0.17)	0.46** (0.14)	0.45** (0.13)	0.59*** (0.14)	.38
Percent coll. ed.+		-1.43*** (0.22)	-0.82* (0.32)	-0.94** (0.30)	-.39
GINI for coll. ed.			2.88* (1.13)	3.17** (1.09)	.37
Scriptural inerrancy				-0.55** (0.20)	-.26
Constant	1.51*** (0.05)	2.04*** (0.09)	1.14** (0.37)	1.46*** (0.37)	
R-squared	0.07	0.42	0.47	0.52	

Note: Data come from Wave I of the National Longitudinal Study of Adolescent Health. N = 75 schools. Estimates denote OLS regression estimates with standard errors in parentheses. Std B is the standardized regression coefficient.

p< .001,

**
p<.01,

*
p<.05; two-tailed tests

Table 3

Normative and social demographic predictors of teen pregnancy prevalence across schools.

	3a	3b	3c	Std B.	3d
Percent black	.12*** (.02)	.12*** (.02)	.06** (.02)	0.27	.04 (.04)
Percent coll. ed. +		-.06 (.05)			
GINI for coll. ed.		.06 (.19)			
Scriptural inerrancy		-.01 (.03)			
Pregnancy norm mean			-.08*** (.02)	-0.67 (.34)	-.77* (.34)
Norm consensus			-.03 (.02)	-0.21	-.56+ (.28)
Mean* consensus					.45* (.21)
Constant	.04*** (.01)	.05 (.06)	.22*** (.05)		1.00* (.48)
R-squared	.28	.33	.51		.25

Note: Data come from Wave I of the National Longitudinal Study of Adolescent Health. N = 75 schools. Estimates denote OLS regression estimates with standard errors in parentheses. Model 3d only includes 38 schools that are between the 25th and 75th percentile for the pregnancy norm. This range was used because of the differences in norm enforcement that were only evidenced within this range.

p<.001,

**
p<.01,

*
p<.05,

+
p<.10; two-tailed tests