How Does Education Affect Fertility?
Educational Enrollment and Attitudinal Change

Emily Marshall
University of Michigan
Population Studies Center
426 Thompson Street
Ann Arbor, MI 48104
eamarsha@umich.edu

Caroline Sten Hartnett
University of South Carolina
Department of Sociology
Sloan College #321
Columbia, SC 29205
hartnetc@mailbox.sc.edu

Abstract: An association between women's education and fertility is well-established: women with more education have fewer children and start childbearing later, on average, than their less educated peers. However, competing theories posit several mechanisms by which educational enrollment may affect fertility, the relative importance of which remains unclear. This study examines the relationship between educational enrollment and changes in attitudes and prototypes to illuminate the mechanisms by which education affects fertility behavior in a population of college-age U.S. women. We first use changes in measures of young women's attitudes and beliefs over time to test competing theories of the mechanisms by which educational enrollment may affect fertility. We then test whether enrollment is associated with changes in prototypes, which reflect associations that may not be tied to consciously-held attitudes.

An association between women's education and fertility has been observed across many contexts. In general, women with more education have fewer children than do women with less education. This association has been observed not only during periods of demographic transition from high to low fertility, but also in the post-transition context of the United States. The negative association of U.S. women's education with fertility levels has been found to be significant even in analyses accounting for the effects of postponement on period rates (Yang and Morgan 2003). Among U.S. women near the end of their childbearing years (ages 40-44), women who had not completed high school had 2.6 children, on average, compared to 1.8 children for women with bachelor's degrees, and 1.7 children for women with graduate or professional degrees (CPS 2010, Table 7).

In addition to differences in the level of completed fertility, women's education is also associated with important differences in the timing of fertility. Women with more education give birth later, on average, than do women with less education (Rindfuss, Morgan, and Offutt 1996). One consequence of this difference in age of childbearing is that more-educated women are more likely to have higher socio-economic status by the time they give birth, and to be able to provide more material resources for their children. Recent work has also highlighted differences by education in the relationship context of fertility: women with more education are more likely to be married when they have children (McLanahan 2009). The association between women's education and fertility thus has implications for family inequality: more educated women are more likely to be able to provide greater socio-economic resources to their children than less educated women, due to differences in their human capital, age at childbearing, and family structure that are associated with education.

Many different explanations for the observed associations between education and fertility have been proposed, and most have found some level of support in empirical studies, but there is still a great deal of uncertainty about the relative importance of the mechanisms behind these associations (see Musick et al. 2009 and Basu 2002 for reviews). One difficulty for attempts to understand how women's education affects fertility is the difficulty of disentangling multiple mechanisms: education simultaneously affects students' human capital, aspirations, and peer groups, among other things. In addition, fertility outcomes may be caused by factors that also lead to selection into education, rather than being caused by education. Scholars have also investigated reverse causality, asking to what extent fertility causes lower educational attainment (Klepinger, Lunger and Plotnick 1995; Moore and Waite 1977). It is thus difficult to determine the relative importance of these processes for the association between higher educational attainment and lower fertility.

This study addresses the problem in a novel way by examining the association between young women's exposure to education and changes in their attitudes toward fertility-related topics. We consider attitudes as moderators of the relationship between education and fertility, using a unique data source with repeated measures of young women's attitudes and beliefs over time. This allows us to observe whether educational enrollment is associated with the changes in attitudes and beliefs predicted by different theories of educational effects on fertility. For example, is educational enrollment associated with *increases* in career aspirations? With *decreases* in perceptions that peers would approve of the respondent getting pregnant? For each of the main mechanisms that are proposed in the literature as ways that education may affect fertility, we use respondents' enrollment status to predict subsequent within-individual change in attitudes. We examine multiple attitudinal measures related to each mechanism.

The Effect of Education on Fertility: Four Mechanisms

The literature on education and fertility points to several mechanisms by which women's education may affect their fertility. Studies have demonstrated empirical support for the influence of each of these mechanisms, but questions remain about their relative importance and how their influence might vary across national and cultural contexts.

One hypothesized mechanism is economic: women with more education have fewer children due to *higher opportunity costs* to spending their time having and raising children, since their education brings them higher wages (Becker 1981). More generally, Barber has shown that women who place greater value on domains of life that may conflict with childbearing, including career and material accumulation, are likely to have fewer children (Barber 2001). Although Barber's account of competing alternatives does not claim that women's higher income is the key causal variable, it also locates the cause of lower fertility in more attractive alternatives—another form of opportunity cost.

A second hypothesized mechanism, sometimes characterized as "cultural" (Musick et al. 2009), is drawn from in Edin and Kefalas's account of poor single mothers, many of whom gave birth early in life (2005). Edin and Kefalas describe women who lack other roles from which they can receive social validation and social connection, and who place greater value on their roles as mothers as a result. These women are more likely to become mothers, even in difficult circumstances, since they see motherhood as the best opportunity for a meaningful and rewarding life. Both the first and second mechanisms describe higher opportunity costs of childbearing for more educated women, although in the first case the tradeoff is material and in the second case the tradeoff involves sources of meaning.

A third theory of how education influences fertility, which has received more attention in lower income countries but may also be applicable in wealthier countries, claims that more education lowers fertility by increasing women's autonomy and self-efficacy (Jejeebhoy 1995). The process of education itself can help women to view themselves as agents in control of their own life outcomes, enabling them to better bargain for or insist on their preferences related to sexual behavior, contraception and childbearing. In the U.S. context, this could mean that enrollment in school increases women's ability to successfully negotiate with partners to implement their choices for sex and use of birth control.

A fourth possible mechanism of influence from education to fertility operates through the exposure to different peer or reference groups that occurs in educational contexts. Education leads women to spend more time with peers who are also enrolled in education. As a result, women enrolled in education may perceive different fertility-related norms among their peers, who are more likely to value education and career aspirations than women who are not enrolled, and may differ in other ways as well. Both descriptive peer norms (what peers are perceived to do themselves) and prescriptive peer norms (what peers are perceived to think of one's own actions) are relevant. Perceived norms can affect women's own attitudes and behavior related to fertility (Morgan and Casterline 1996), as a source of information about childbirth and life after childbirth (Bernardi 2003), and also as a source of social influence. A recent study of young people in the U.S. using data on friends and school contexts found evidence of friends' influence on childbearing (Balbo and Barban 2014). Since educational enrollment shapes peer and friend groups, perceived peer norms can be a pathway by which education affects fertility.

In addition to these mechanisms proposed in the literature, we also examine how educational enrollment is related to changes in respondents' evaluations of fertility-related

prototypes—their perceptions of prototypical people who engage in certain fertility-related behaviors. These measures capture generalized judgments, rather than respondents' attitudes to specific topics and scenarios, complementing the other analyses.

Analytic Approach

In existing studies of this topic, the most common approach to adjudicating among competing mechanisms by which women's education affects fertility is to predict fertility outcomes by regressing education on the outcome of interest, then adding variables believed to represent intervening mechanisms to the model. The extent to which the association between education and the fertility outcome of interest remains is then used as a test of the extent to which these variables are the mechanisms causing the outcome. In one such study, a one-time measure of desired family size and a time-varying measure of wages are used to test the association between education and fertility (Musick et al. 2009). Another study used more extensive measures of attitudes to examine which of many measures mediate the relationship between school enrollment and *unintended* pregnancy, using time lags to address the concern of reverse causality (Yarger 2012).

The main innovation of our analyses is the use of within-individual change over time in mediating variables to test theories of the mechanisms by which education could affect fertility. Rather than directly examining whether an intervening variable statistically accounts for variation in education and fertility, we test whether changes in mediating attitudes differ significantly by educational enrollment status, in ways consistent with each hypothesized pathway. We compare the likelihood of change in the hypothesized directions among enrolled women, compared to non-enrolled women. This allows us to observe differences in how enrolled and non-enrolled women's attitudes change over time. Some differences may still be due to

selection, as the women enrolled in education may still differ from non-enrolled women in such a way that changes observed during their enrollment might not be observed in the other women, were they to enroll. These analyses are nonetheless valuable as descriptive analyses of how fertility-related attitudes change over time by educational enrollment status, since thus far no such longitudinal analysis with such a rich collection of measures has been conducted. Evidence that attitudinal changes over time vary by educational status will not prove a causal effect of education on these attitude. However, the absence of expected differences by educational status, or the absence of expected changes in attitudes, will provide compelling evidence that within this context, the hypothesized mechanisms are not observed.

Data, Measures, and Hypotheses

Our study uses data from the Relationship Dynamics and Social Life study, a longitudinal survey of a population-based sample of women ages 18-19, who were followed for a period of two years. Respondents were sampled from a county in Michigan, and the sample is socioeconomically and racially diverse. The response rate for the baseline interview was 84% and the cooperation rate was 93%, yielding 1,003 baseline interviews. Of those who participated in the baseline interview, 99% agreed to participate in the longitudinal data collection (n=992). The survey includes an extensive array of attitudinal items related to the hypothesized pathways described above. Respondents completed weekly journals—short surveys completed online or by phone. Our study uses rotating modules of attitudinal measures and reports of educational enrollment that were included in the weekly journals, repeated quarterly, or in every thirteenth journal.

We operationalize the four mechanisms described above using the following attitudinal measures:

1. Higher opportunity costs to childbearing and child rearing: If education affects women's perceptions of the opportunity costs of childbearing by increasing their expected returns to time spent in labor force participation, then education should increase women's expected income. It should also increase their beliefs that they will complete higher levels of education, which would increase their returns for work outside the home, whether the rewards take the form of salary or personal fulfillment.

Measures: What are the chances that you will have a middle-class income by age 30? What are the chances that you will graduate from college?

2. Value placed on having children and role of mother: If education gives women access to rewarding roles and activities besides that of mother, then women enrolled in education should become *less* likely to report that motherhood is the most important thing in their lives, *more* likely to report higher ideal ages for marriage and childbearing, and more likely to report smaller ideal family size.

Measures: Being a mother and raising children is the most fulfilling experience a woman can have (agree/disagree). What would be the ideal age for you to get married/have a child? What is the ideal number of children for an average American family?

3. Autonomy and Self-Efficacy: Education may increase women's sense of control over their behavior and increase their belief that fertility can and should be under their control. We measure autonomy using a set of three items about respondents' ability to influence a partner's behavior related to sex and contraception. Women enrolled in education should increasingly believe that they can influence sexual partners' behavior and be willing to refuse to have sex.

Measures: Imagine you were with a partner who wanted to have sex but you did not. What are the chances that you could stop your partner from having sex with you? If you decided to have

sex, what are the chances that you could get your partner to withdraw or "pull out" before ejaculating or coming? If you decided to have sex, what are the chances that you could get your partner to use a condom?

4. Peer Effects: Education may expose women to different peer groups and thus change their perceptions of descriptive norms (what people are doing) and prescriptive norms (what people think is important) among their peers. We expect that women enrolled in education will perceive that fewer of their friends have had sex or sex without birth control, have gotten pregnant, or are parents. We also expect that enrolled women will come to perceive less approval from their friends for having sex or sex without birth control, getting pregnant, or having a baby.

Measures: Descriptive norms: How many of your friends have had sexual intercourse? …have had sexual intercourse without using birth control? …have gotten pregnant? …are parents? Prescriptive norms: How would your friends react if you had sexual intercourse? ...if you had sexual intercourse without using birth control? …if you got pregnant? … if you had a baby?

The measures of the four mechanisms described above are used to construct the dependent variables for our analyses of the association between educational enrollment status and changes in these outcomes. For each attitudinal measure, for each participant, for each set of two consecutive quarterly observations, we observe whether there was a positive change, no change, or a negative change in the measure. Measures are reverse-coded where needed so that a positive change is always a change in the direction hypothesized by the four theories presented above.

Prototypes: The mechanisms by which education may affect fertility, discussed above, may also affect the way that young women evaluate prototypical cases of people who engage in certain behaviors—in this case, getting pregnant and having sex without using birth control. These

effects of education on fertility-related prototypes may be either conscious or non-conscious, but they capture a distinct dimension of attitudinal change. We expect that enrolled young women will be more likely to change their evaluations to become more negative about women who get pregnant or have sex without using birth control, and more positive about women who go to college, than will their non-enrolled peers. If significant associations are found between enrollment status and changes in fertility-related prototypes, additional analyses will examine whether other attitudinal changes mediate this association, suggesting that changes in the other attitudes in this study account for changes in evaluations of prototypes, or whether the association goes beyond the other attitudinal changes studied here.

Measures: What do you think about young women your age who get pregnant? Would you say they are not at all, somewhat, fairly, very, or extremely intelligent? …careless? … cool? What do you think about young women your age who have sex with no birth control? Would you say they are not at all, somewhat, fairly, very, or extremely intelligent? …careless? … cool?

Independent variables: The independent variables of interest are measures of educational enrollment status. The data contain two measures of enrollment status: intensity (full-time and part-time) and institution type (four-year college and two-year, vocational, or technical college). These two measures reflect two different ways of thinking about *how* educational enrollment affects fertility. Full-time versus part-time enrollment is a better measure of exposure to educational environments: on average, people who are enrolled full-time should spend more time in educational settings than those enrolled part-time. Institution type is a better measure of the types of activities that education is preparing enrollees for, with four-year institutions representing a higher credential than two-year, vocational, or technical institutions. There is an association between these two dimensions in these data: for observations in which respondents

report four-year college enrollment, about 8 percent are enrolled part-time, while about 30 percent of reports of two-year, vocational, and technical enrollment are part-time. We present results between below of analyses using both measures of enrollment status as independent variables. Analyses of enrollment intensity use a dichotomous measure of part-time enrollment and a dichotomous measure of full-time enrollment as independent variables. Analyses of institution type use a dichotomous measure of enrollment in four-year college and a dichotomous measure of enrollment in two-year, vocational, or technical college as independent variables. Additional analyses using enrollment intensity are presented in the Appendix. Analogous additional analyses using institution type produced very similar results (available upon request).

Control variables: All analyses control for measures of socioeconomic status and life experiences expected to affect fertility-related attitudes. Age at the beginning of the study, race[1], parents' income (four categories), receipt of public assistance (current and ever), childhood family structure (parents' marital status and having a mother who gave birth before age 20), prior pregnancy, and prior birth are the control variables used.

Methods

Our first set of analyses tests the likelihood that enrolled young women experience changes in attitudes in the direction consistent with each theory of educational influence on fertility, compared to non-enrolled young women. We first test differences by intensity of enrollment, comparing non-enrolled, part-time enrolled, and full-time enrolled respondents. We then text differences by educational institution type, comparing non-enrolled women to women enrolled in four-year institutions, and to women enrolled in two-year, vocational, or technical institutions. We use logistic regression to model whether there is a change in the in the

[1] Participants are nearly all either black and or white, so the measure of race used is a dichotomous variable for African-American.

hypothesized direction in the period immediately following the report of enrollment: a change in the hypothesized direction is coded as 1; no change or a change in the opposite direction is coded as 0.[2] For each of the four mechanisms, we combine the measures for that mechanism into a standardized scale to simplify presentation of results. Results for each individual attitudinal measure are presented in the Appendix.

Our second set of analyses examines whether prototypes are associated with educational enrollment in the expected direction. Again, we use logistic regression to predict whether responses change in the hypothesized direction, versus not changing or changing in the opposite direction, and test whether educational enrollment status is associated with this outcome.

Results

Table 1 presents results for the association of educational enrollment intensity (non-enrolled versus full-time and part-time enrollment) and the attitudinal scales. In all tables, coefficients represent odds ratios. Table 2 presents results for the association of educational enrollment type (non-enrolled versus four-year college and two-year, technical, or vocational college) and the attitudinal scales. Column 1 of Table 1 indicates strong support for the theory that educational enrollment is associated with increases in expectations for future income and educational attainment: both full-time and part-time enrollment are associated with greater probability of a positive change in the career expectations scale, compared to non-enrollment. In Table A1, columns 2 and 3 show that respondents enrolled full-time are significantly more likely to have positive changes in both of the measures in this scale than are respondents who are not enrolled in school. The odds of a positive change in respondents' belief that they will have a middle-class income by age 30 are about 32 percent higher for full-time enrolled respondents

[2] Tests showed that ordered logistic regression is not appropriate for these analyses, since the proportionate odds assumption is violated.

than for non-enrolled respondents, and about 28 percent more likely for part-time enrolled respondents than for non-enrolled respondents.

Column 2 of Table 1 shows no significant association between enrollment status and probability of a positive change in family ideals, the measures of the mechanism sometimes thought of as cultural. Again, reverse coding means that a positive change in family ideals here indicates attitudinal changes associated with lower fertility, such as higher ideal age at marriage and smaller ideal family size. In Table A2, columns 2 through 5 show no significant associations between enrollment status and any of the measures included in the family ideals scale, with the exception of a marginally significant association between part-time enrollment and probability of a positive change in perceived importance of motherhood. Again, with reverse coding, this means that respondents enrolled part-time are more likely than non-enrolled respondents to agree *less* over time that "being a mother is the most important thing a woman can do."

Column 3 of Table 1 shows that women enrolled full-time, but not women enrolled part-time, are significantly more likely than non-enrolled women to exhibit positive changes in measures of autonomy over time. In Table A3, columns 2 through 5 show that both part-time and full-time enrollment are associated with positive change in women's belief that they can convince their partner to wear a condom. Only full-time enrollment is associated with positive change in their belief that they can stop their partner from having sex with them. There is no significant difference by enrollment status in positive change in respondents' belief that they can convince their partner to withdraw during sex.

Columns 4 and 5 of Table 1 indicate that enrollment status is not significantly associated with changes in perceived peer *behavior*, but that full-time enrollment is significantly associated with changes in perceptions of peer *evaluations* of respondent behavior. In Table A4a, columns 2

through 5 show that the only significant associations of enrollment with individual measures of peer behavior are a marginally significant positive association between full-time enrollment and a positive change in reports of the proportion of peers who have sex, and the proportion who have sex without birth control. Here again, reverse coding means that full-time enrolled respondents are more likely than non-enrolled respondents to change their responses over time to report *fewer* friends with these behaviors than they reported before, although the association is only significant at the 0.1 level. In Table A4b, however, columns 2 through 5 show that respondents enrolled full-time are significantly more likely to have a positive change in reports of how their friends would react if they got pregnant or had a baby. Here again, a positive change means that they report *less* approval from friends than they did before.

Table 2 presents results from analyses using educational enrollment by institution type, instead of by intensity, as independent variables. The only notable difference between the results in Tables 1 and 2 is in column 3: enrollment in any institution type was associated with a significantly greater probability of positive change in autonomy, compared to non-enrollment. Analysis of individual items in the scale shows that this difference is due to the item measuring respondents' belief that they can stop their partner from having sex with them: As noted above, Table A2 shows that there is no significant association between part-time enrollment and changes in this belief, while analyses of institution type (not shown; available upon request) show that respondents enrolled in two-year, vocational, or technical institutions are significantly more likely to have a positive change in this measure than non-enrolled respondents.

Table 3 presents results for each measure of fertility-related prototypes for two behaviors: getting pregnant and having sex without using birth control. Columns 1 through 3 contain results for the former, and column 2 shows that the odds of strengthening the belief that women the

respondent's age who have children are careless are significantly higher (about 58 percent higher) for full-time enrolled respondents than for non-enrolled respondents, but that there is no significant association between part-time enrollment and positive changes in this belief. Columns 1 and 3 show that no significant association was found between enrollment status and thinking that such women are intelligent or cool. Columns 4 and 5 show that the odds of *decreased* (due to reverse coding) belief that women who have sex without birth control are intelligent, and increased belief that they are careless, are significantly higher for respondents enrolled full-time than for non-enrolled respondents, while column 6 shows no significant association with decreased belief that such women are cool.

Discussion

In summary, women enrolled in education full-time are significantly more likely than non-enrolled women to experience attitudinal changes consistent with some, but not all, of the hypothesized mechanisms by which education is believed to affect fertility. We find that full-time enrolled respondents are significantly more likely than non-enrolled respondents to report increases in expectations for income and educational attainment, increases in autonomy, and increases in perceptions that peers would react negatively if respondents got pregnant or had a baby. We also find that part-time enrolled respondents are significantly more likely than non-enrolled respondents to report increases in expectations for income and educational attainment. However, we find that enrolled respondents are *not* significantly more likely than non-enrolled respondents to decrease the subjective value they place on motherhood or ideal family size, or increase their desired age of marriage or childbearing. We also find only marginally significant differences by educational enrollment status in how likely respondents are to report changes in the perceived behavior of their friends: full-time enrolled respondents are marginally more likely

than non-enrolled respondents to report decreases in how many of their friends have had sex, and how many have had sex without birth control.

One limitation of the paper is that sample examined here—a population-representative sample of women ages 18-22 in a single U.S. county—may not be representative of larger populations of interest. However, we believe that the findings are still a valuable contribution. The variety and richness of the repeated attitudinal measures used in these analyses is simply not available in nationally-representative datasets. Although the processes examined here may not be as relevant to young women with extremely different labor-force prospects or educational opportunities, and should not be extrapolated to such populations, these findings can inform future research on college-age U.S. women.

Conclusion

The analyses presented in this paper suggest that women enrolled in education do experience many changes in fertility-related attitudes predicted by theories of the mechanisms by which education affects fertility, and that these changes are significantly more likely among enrolled women than non-enrolled women. Considering enrollment intensity, greater differences are seen between women who are enrolled full-time and non-enrolled women, with lesser differences between women enrolled part-time and non-enrolled women. Considering type of educational institution, greater differences are seen between women who are enrolled in four-year colleges and non-enrolled women, with lesser differences between women enrolled in two-year, vocational, or technical colleges and non-enrolled women.

We find strong evidence for the *economic* mechanism, with large and significant differences in likelihood of attitudinal change between enrolled and non-enrolled women: enrolled women are much more likely to experience attitudinal changes consistent with this

mechanism. We also find evidence for the *autonomy* mechanism. Large and significant differences in likelihood of changes consistent with this mechanism are found between full-time enrolled women and non-enrolled women, as well as between women enrolled in both types of educational institutions and non-enrolled women. Finally, we find evidence consistent with the peer influence mechanism, via *peer evaluations* but not peer behavior. Full-time enrolled women and women enrolled in four-year institutions are significantly more likely than non-enrolled women to experience attitudinal changes consistent with this mechanism: they are more likely to report expecting increasingly negative reactions from friends if they had a baby or got pregnant.

We do not find support for all of the hypothesized mechanisms, however. The lack of significant differences by educational enrollment status for the *cultural* (or family ideals) and *peer behavior* mechanisms indicates that these processes may not be relevant for educational effects on fertility behavior in the population studied here.

Our findings suggest that future studies of the relationship between education and fertility in the U.S. and similar contexts may want to continue to focus on economic prospects and expectations, but may benefit from greater focus on the relationship between education and young women's autonomy, a topic that has received more attention in lower-income countries. These results also suggest that differences in the subjective value of motherhood, while important in some contexts, may have limited relevance as a mechanism of influence of education on fertility attitudes and behavior. Finally, future studies of peer effects may benefit from distinguishing between perceived peer behavior and peer evaluations, since we find stronger support for the relevance of the latter than the former.

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Table 1: Educational enrollment and fertility-related attitudinal scales: Enrollment intensity (Odds ratios)

	Career expectations	Family ideals	Autonomy	Peer behavior	Peer approval
Attending school full-time (Ref=Not attending)	1.772**	0.898	1.318**	1.143	1.234*
Attending school part-time	1.627**	0.983	1.241	0.989	1.087
Age at baseline	0.976	0.951	0.971	0.933	1.036
Black	1.072	0.895	0.935	1.063	1.059
Parent income LT $15k (Ref=$15-44k)	0.933	0.976	0.978	1.052	1.266^
Parent income $45-75k	1.001	0.943	1.030	1.267*	1.044
Parent income GT $75k	1.022	1.135	1.277*	0.967	0.934
Parent income-DK/Ref	1.077	1.147	1.142	1.169	1.199
Public Asst.-Currently	1.153	0.947	1.029	1.077	0.793
Public Asst.-Ever	0.775	1.393*	0.775	0.858	1.101
Mom 1st birth < age 20	0.881	0.897	0.902	0.836*	0.870
Childhood family-Single (Ref=Bio/Step)	0.914	1.061	1.071	0.792**	0.991
Childhood family-Other	1.048	1.098	0.694^	0.911	0.951
Prior pregnancy but no birth	0.920	1.066	0.829	0.813	0.773^
Prior birth	1.110	0.675**	1.357*	0.608**	0.961
Attitude at time 1 of 2	0.390**	0.423**	0.235**	0.362**	0.338**
Observations	3512	3501	3994	4205	4143

^ p<0.10 * p<0.05 ** p<0.01

Table 2: Educational enrollment and fertility-related attitudinal scales: Institution type (Odds ratios)

	Career expectations	Family ideals	Autonomy	Peer behavior	Peer approval
Attending 4-year college (Ref=Not attending)	1.824**	0.936	1.327**	1.146	1.319**
Attending 2-year, vocational, or technical college	1.646**	0.881	1.307*	1.086	1.092
Age at baseline	0.970	0.954	0.968	0.927	1.028
Black	1.073	0.901	0.931	1.056	1.060
Parent income LT $15k (Ref=$15-44k)	0.933	0.982	0.979	1.051	1.274^
Parent income $45-75k	0.999	0.942	1.029	1.265*	1.042
Parent income GT $75k	1.006	1.118	1.275*	0.964	0.910
Parent income-DK/Ref	1.071	1.153	1.140	1.162	1.195
Public Asst.-Currently	1.160	0.944	1.033	1.083	0.803
Public Asst.-Ever	0.769	1.396*	0.772	0.852	1.084
Mom 1st birth < age 20	0.887	0.898	0.905	0.841*	0.880
Childhood family-Single (Ref=Bio/Step)	0.921	1.064	1.074	0.796**	1.004
Childhood family-Other	1.048	1.104	0.693^	0.907	0.947
Prior pregnancy but no birth	0.919	1.083	0.825	0.806	0.773^
Prior birth	1.113	0.684**	1.357*	0.605**	0.967
Attitude at time 1 of 2	0.390**	0.421**	0.235**	0.362**	0.336**
Observations	3512	3501	3994	4205	4143

^ p<0.10 * p<0.05 ** p<0.01

Table 3: Educational enrollment and fertility-related prototypes: Enrollment intensity (Odds ratios)

	What do you think about young women your age who get pregnant? Are they…			*What do you think about young women your age who have sex with no birth control? Are they…*		
	… intelligent	… careless	… cool	… intelligent	… careless	… cool
Attending school full-time (Ref=Not attending)	1.154	1.580**	1.061	1.586*	1.311*	1.021
Attending school part-time	0.908	1.279	0.714	1.114	0.808	0.948
Age at baseline	0.835^	0.858^	0.945	0.782	1.226*	0.646*
Black	1.229	0.883	1.042	0.889	0.658**	0.762
Parent income LT $15k (Ref=$15-44k)	0.838	1.121	1.322	1.093	0.855	1.175
Parent income $45-75k	1.069	1.187	1.115	1.047	1.129	1.018
Parent income GT $75k	0.917	1.025	1.073	1.390	1.051	0.962
Parent income-DK/Ref	0.700^	0.995	0.762	1.066	0.929	1.079
Public Asst.-Currently	1.308	0.776	1.114	2.131^	2.067*	2.696
Public Asst.-Ever	0.971	1.221	1.046	0.418*	0.522*	0.470
Mom 1st birth < age 20	0.842	0.807^	1.199	1.274	0.954	0.941
Childhood family-Single (Ref=Bio/Step)	0.805	1.085	1.203	1.218	1.203	1.137
Childhood family-Other	0.979	1.016	0.822	1.002	1.273	1.522
Prior pregnancy but no birth	0.715^	0.476**	0.570	1.039	0.718	0.700
Prior birth	0.980	0.759	0.905	1.656	0.973	0.807
Attitude at time 1 of 2	0.194**	0.282**	0.157**	0.131**	0.225**	0.149**
Observations	3812	3817	3804	3912	3915	3900

^ p<0.10 * p<0.05 ** p<0.01

Table A1: Educational enrollment and changes in career expectations (Odds ratios)

	Career expectations scale	Chances of middle-class income	Chances of college graduation
Attending school full-time (Ref=Not attending)	1.772**	1.320**	1.483*
Attending school part-time	1.627**	1.283^	1.861**
Age at baseline	0.976	1.000	0.973
Black	1.072	1.027	0.878
Parent income LT $15k (Ref=$15-44k)	0.933	0.896	0.932
Parent income $45-75k	1.001	1.090	0.736^
Parent income GT $75k	1.022	1.125	0.946
Parent income-DK/Ref	1.077	1.163	0.841
Public Asst.-Currently	1.153	1.037	1.429
Public Asst.-Ever	0.775	0.871	0.628^
Mom 1st birth < age 20	0.881	0.822^	0.965
Childhood family-Single (Ref=Bio/Step)	0.914	0.872	1.144
Childhood family-Other	1.048	1.322	1.000
Prior pregnancy but no birth	0.920	0.941	1.009
Prior birth	1.110	1.228	1.253
Attitude at time 1 of 2	0.390**	0.495**	0.363**
Observations	3512	3512	4335

^ p<0.10 * p<0.05 ** p<0.01

Table A2: Educational enrollment and changes in family ideals (Odds ratios)

	Family ideals scale	Importance of motherhood	Ideal marriage age	Ideal age at first birth	Ideal family size
Attending school full-time (Ref=Not attending)	0.898	1.044	0.927	0.970	1.047
Attending school part-time	0.983	1.296^	1.196	1.097	1.042
Age at baseline	0.951	0.891	0.970	1.033	1.112
Black	0.895	0.962	1.295**	1.119	0.638*
Parent income LT $15k (Ref=$15-44k)	0.976	1.244	1.061	0.861	0.882
Parent income $45-75k	0.943	1.041	0.869	0.800*	0.992
Parent income GT $75k	1.135	1.184	1.037	1.035	0.972
Parent income-DK/Ref	1.147	1.414*	0.964	0.957	0.910
Public Asst.-Currently	0.947	0.819	1.170	0.886	1.091
Public Asst.-Ever	1.393*	1.437^	1.103	1.243	1.061
Mom 1st birth < age 20	0.897	0.778*	1.026	0.896	0.893
Childhood family-Single (Ref=Bio/Step)	1.061	1.087	1.158	0.991	1.279
Childhood family-Other	1.098	1.486	1.633**	1.026	0.923
Prior pregnancy but no birth	1.066	1.067	1.056	0.988	0.953
Prior birth	0.675**	0.490**	1.160	0.588**	0.913
Attitude at time 1 of 2	0.423**	0.415**	0.487**	0.491**	0.282**
Observations	3501	3624	3586	3645	3559

^ p<0.10 * p<0.05 ** p<0.01

Table A3: Educational enrollment and changes in autonomy attitudes (Odds ratios)

	Autonomy scale	Can convince partner to wear condom	Can convince partner to withdraw	Can stop partner from having sex
Attending school full-time (Ref=Not attending)	1.318**	1.442*	1.168	1.411**
Attending school part-time	1.241	1.478*	1.139	1.068
Age at baseline	0.971	1.148	1.034	0.934
Black	0.935	1.111	0.826	0.717*
Parent income LT $15k (Ref=$15-44k)	0.978	0.858	0.848	0.850
Parent income $45-75k	1.030	0.930	0.921	0.835
Parent income GT $75k	1.277*	1.563**	1.104	1.073
Parent income-DK/Ref	1.142	0.989	1.194	1.216
Public Asst.-Currently	1.029	0.918	1.269	1.074
Public Asst.-Ever	0.775	1.011	0.710^	0.725
Mom 1st birth < age 20	0.902	0.713*	1.072	0.760*
Childhood family-Single (Ref=Bio/Step)	1.071	1.118	1.029	0.887
Childhood family-Other	0.694^	0.902	1.019	0.797
Prior pregnancy but no birth	0.829	0.959	1.084	0.934
Prior birth	1.357*	1.132	1.361^	1.107
Attitude at time 1 of 2	0.235**	0.309**	0.377**	0.279**
Observations	3994	4036	4007	4051

^ p<0.10 * p<0.05 ** p<0.01

Table A4a: Educational enrollment and changes in perceived peer behavior (Odds ratios)

	How many of your friends…				
	Peer behavior scale	… have had sex	… have had sex without birth control	… have gotten pregnant	… are parents
Attending school full-time (Ref=Not attending)	1.143	1.237^	1.225^	1.156	1.135
Attending school part-time	0.989	1.207	1.154	1.191	1.067
Age at baseline	0.933	0.955	1.032	0.972	1.066
Black	1.063	1.195	0.935	0.910	1.025
Parent income LT $15k (Ref=$15-44k)	1.052	1.589*	0.994	0.899	0.748
Parent income $45-75k	1.267*	1.166	1.088	1.421*	1.338*
Parent income GT $75k	0.967	0.917	0.947	1.164	1.024
Parent income-DK/Ref	1.169	1.579**	1.095	1.069	1.229
Public Asst.-Currently	1.077	1.104	1.537^	1.108	1.184
Public Asst.-Ever	0.858	0.856	0.540**	1.051	0.744
Mom 1st birth < age 20	0.836*	0.992	0.910	1.010	0.794^
Childhood family-Single (Ref=Bio/Step)	0.792**	0.849	0.827	0.966	0.855
Childhood family-Other	0.911	1.074	0.973	1.137	0.993
Prior pregnancy but no birth	0.813	0.819	1.016	0.864	0.755
Prior birth	0.608**	0.704^	0.855	0.523**	0.552**
Attitude at time 1 of 2	0.362**	0.788**	0.286**	0.285**	0.248**
Observations	4205	4255	4208	4249	4249

^ p<0.10 * p<0.05 ** p<0.01

Table A4b: Educational enrollment and changes in perceived peer evaluations (Odds ratios)

		How would your friends react if you…			
	Peer approval scale	… had sex	… had sex without birth control	… got pregnant	… had a baby
Attending school full-time (Ref=Not attending)	1.234*	1.007	1.208	1.365**	1.295*
Attending school part-time	1.087	0.984	0.832	1.045	1.102
Age at baseline	1.036	1.074	1.017	1.002	0.944
Black	1.059	1.338*	0.814	1.070	1.024
Parent income LT $15k (Ref=$15-44k)	1.266^	1.270	0.919	1.069	1.086
Parent income $45-75k	1.044	1.051	1.101	0.908	0.927
Parent income GT $75k	0.934	0.774	1.062	1.023	0.836
Parent income-DK/Ref	1.199	1.351^	1.158	1.049	0.966
Public Asst.-Currently	0.793	0.981	0.966	0.731	0.960
Public Asst.-Ever	1.101	0.885	1.041	1.065	0.938
Mom 1st birth < age 20	0.870	1.009	0.850	0.853	0.937
Childhood family-Single (Ref=Bio/Step)	0.991	0.994	1.117	0.809^	0.943
Childhood family-Other	0.951	1.194	0.827	0.986	0.861
Prior pregnancy but no birth	0.773^	0.841	0.699	0.713^	0.736
Prior birth	0.961	1.010	1.071	0.891	0.804
Attitude at time 1 of 2	0.338**	0.357**	0.265**	0.285**	0.331**
Observations	4143	4162	4163	4164	4161

^ p<0.10 * p<0.05 ** p<0.01