Cultural Meanings and the Aggregation of Actions:
The Case of Sex and Schooling in Malawi

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This article examines the relationship between cultural and behavioral patterns in social life. People make sense of their social world through a stock of shared narratives, which influence the everyday actions of individuals, both in terms of deliberate decisions as well as subconscious behavioral responses (Bruner 1991; Holland and Quinn 1997; Somers 1992; Somers and Block 2005; White 2009). The accumulation of these actions constitutes the behavioral patterns of action that sociologists seek to measure and understand, and demographers have recently pointed to the need to examine the extent to which demographic phenomena are “shaped and sustained” by shared cultural schemas and beliefs (Johnson-Hanks et al. 2011:2; see also: Johnson-Hanks 2002; Morgan 2011; Thornton 2005; Watkins 2000). And yet research has shown that these narratives are often incongruent with aggregate-level behavioral trends and that they conform to a unique and autonomous logic (Bruner 1991; Ewick and Silbey 2003; Tilly 2002; White 2008, 2009). How can cultural meanings simultaneously diverge from and constitute aggregate patterns of action?

Using the empirical case of sexual relationships and schooling exits in Malawi, I show that the collective narratives that teachers and students use to understand why relationships curtail girls’ schooling do not account for the statistical association between these two events. Yet I also demonstrate these cultural beliefs have real effects: teachers, parents, and students act as if these narratives were true, and in so doing help to sustain the antinomy between sex and schooling.

Previous research has established that sexual relationships and school dropout are both culturally and statistically linked for adolescent girls in sub-Saharan Africa (Biddlecom et al. 2008; Clark and Mathur 2012; Eloundou-Enyegue 2004; Frye 2012; Grant 2012; Lloyd and Mensch 2008; Poulin 2007; Wight et al. 2006). Reaching back to the missionary roots of schooling in the region, a pervasive cultural schema demarcates educational endeavors from sexual thoughts, words, and deeds (Frye 2012; Poulin 2007). Sexual relationships are widely believed to render women unfit to continue in school triggering a downward spiral of reduced ambition and competing allegiances resulting in girls leaving school (Grant 2012; Wight et al. 2006). And survey data have shown that sexual relationships significantly predict school exit for female students (Biddlecom et al. 2008; Clark and Mathur 2012).

Consistent with these previous studies, I show sexual relationships are associated with school dropout for female students in Malawi. However, the collective narratives that teachers and students use to understand why relationships curtail girls’ schooling do not explain the statistical association between these two events. The collective narratives are all centered around the belief that sexual
relationships make female students incapable of succeeding in school: they are tempted to skip school to be with their partners, they are distracted and cannot learn, and they become pregnant and are forced to leave school. Yet compared with their single peers, female students in relationships are no more likely to be absent from school or perform worse academically. And while pregnancy does indeed curtail schooling trajectories for the minority of students who become pregnant while in school, the prevalence of pregnancies among students is highly overstated by interview respondents, and the association between relationships and leaving school persists when students who become pregnant are removed from the sample. In sum, while teachers and students are correct that students in sexual relationships face a much higher risk of dropping out, their shared understandings about why this is true are inconsistent with the empirical reality of sexual and educational trajectories in this context.

Returning to the interviews, I show that these narratives are nonetheless crucial to our understanding of the aggregate-level association between sex and school dropout, because of the various ways that individuals structure their behavior in accordance with these shared beliefs. All students in my sample, along with their teachers and parents, make decisions within a normative environment that conjoins sex and school failure. Teachers’ punitive actions result in youth leaving school before changes are detectable in their performance or behavior. Parents disinvest from students they believe are sexually active, leading to temporary or permanent departures from school. Students respond in contrasting ways: some enter into relationships as a socially-codified exit from school, while a high-achieving minority pursue “school positive” relationships constructed in opposition to the dominant model of relationships. These behavioral responses contribute to the aggregate level association between sexual relationships and early school-leaving.

Interview evidence also shows that collective narratives opposing sex and schooling are infused with broader understandings of gender and sexuality, specifically women’s vulnerability and the irresistibility of sex for adolescent girls, and the survey data indeed reveal strong gender differences in outcomes: women (but not men) are more likely to leave school if they are in a relationship. Yet the mechanisms posited in the collective narratives—absenteeism, poor performance, and pregnancy—cannot account for women’s increased risk of school exit relative to male students. When we turn from cultural narratives to cultural practices, we begin to understand that the behavioral responses described above are specifically directed towards girls; female students are subject to special scrutiny and held to higher standards of sexual purity.
This analysis reveals new insights into the relationship between cultural meanings and aggregate-level demographic phenomena. Three insights are particularly helpful in advancing our understandings of how collective narratives are both divergent from and constitutive of empirical reality. First, the behavioral responses documented here are social and intersubjective in nature: the various ways that teachers, parents, and other students behave in accordance with these narratives constitute a plexus of actions that render the schooling trajectories of students conditional on their sexual comportment or reputation. This suggests that collective narratives may influence behavior in large part through people perceiving others through the lens of stock characters and interacting with them in ways that conform to standard plots. If this is true in other cases, then these intersubjective processes will be largely invisible in surveys, which aggregate the experiences and perspectives of individuals but allow for scant insights into the ways that our actions structure the opportunities and choices of other people.

Second, the collective narratives documented here are characterized by an axiomatic association between cause and outcome: because people believe that sexual relationships inevitably and without exception lead to school dropout, they act in ways that are consonant with this understanding of the world before any other indicators of decreased school fitness are apparent. This temporal dimension may mask even widespread inconsistencies between narratives and behavioral patterns, as people act preemptively in ways that conform to the narrative logic before contradictions can be observed.

And third, the narrative accounts hinge on a moral model of causality: students are believed to drop out due to the consequences of their own transgressions. As a result, these narratives allow people in Malawi to continue to believe that educational institutions reward those who behave appropriately in a context of unpredictability and lack of opportunity. In this way, by emphasizing the causal power of individual moral failings, collective narratives shift people’s attention away from the ways that the intersubjective behavioral patterns described above—as well as institutional processes—work to sustain the cultural schemas underlying collective narratives.

THEORIZING CULTURAL UNDERSTANDINGS OF POPULATION PROCESSES

Schemas and Narratives

In examining shared meanings surrounding sex and schooling, I use the concept of cultural schemas, which Sewell (1992:13) describes as “virtual” elements of structure. Many definitions for cultural schemas exist; I adopt that of Blair-Loy (2001:689), which incorporates cognitive, normative,
and motivational dimensions: “an ordered, socially constructed, and taken-for-granted framework for understanding and evaluating self and society, for thinking and for acting.” Cultural schemas influence how our minds simplify and store information (Strauss and Quinn 1997). Schemas are, by definition, abstract, simplified, and underdetermined; they influence our cognition primarily through non-conscious channels (D’Andrade 1995; Johnson-Hanks et al. 2011; Strauss and Quinn 1997; Vaisey 2009). For example, Allendorf (2013) shows how young people in India approach potential partnerships through the lens of two alternate schemas marriage schemas: one characterized by arranged marriages and another by elopements. Saguy and Stuart (2008) describe how cultural schemas of social identity are influenced by legal history; for example, the Americans with Disabilities Act of 1990 led to a number of subtle changes to daily life that resulted in a shared understanding of “disabled” as a salient social category.

People also make sense of the social world through consciously deploying stocks of shared stories that link events and processes together according to a narrative logic. To understand the role played by these shared stories, I build upon the concept of collective narratives (Abolafia 2010; Bruner 1991; Ewick and Silbey 2003; Polletta et al. 2011; Somers 1992; Somers and Block 2005; see also Tilly 2002 on “standard stories”; White 2008 on “folk theories”). Scholars point to three elements of collective narratives: they involve selective appropriation of symbolic events or characters, these elements are temporally ordered, and events are understood through their relationship to other events and to a broader thematic structure, known as “emplotment” (Ewick and Silbey 2003; Somers 1992, 1996; Tilly 2002).

Narratives can be understood as intermediate between social interactions and experiential reality of social interactions and the highly abstract domain of schemas; indeed, narratives are said to “bridge the gap between daily social interaction and large-scale social structures.” In my empirical case, cultural schemas reflect a general opposition between sexual and scholastic pursuits and a framework of girls’ heightened vulnerability; these serve as general frameworks that shape how individuals organize and make sense of new information related to these topics. While three prominent narratives describe specific pathways through which relationships lead girls to leave school (see Figure 1).

**Empirical Generalities and Narrative Particularities**

Collective narratives are often contrasted with the understandings that emerge through scientific analysis of aggregate patterns of behavior. These two types of social meaning have been
central to the field of sociology from its inception; Weber distinguishes between “adequacy with respect to meaning” and “evidence of statistical uniformity” (1978, p. 12). Bourdieu (2008:95) makes a similar distinction between *practical* knowledge, “the truth immediately given to lived consciousness” and *scientific* knowledge, “the truth laboriously acquired through scientific reflection,” and posits that these two types of meaning will rarely cohere (he calls this state misrecognition). More recently, White (2009:24) writes, “The notion that sequences of real events possess the formal attributes of the stories we tell could only have its origins in wishes, daydreams, reveries.”

Narratives are said to diverge from empirical patterns of behavior because they follow a distinct logic, which emphasizes a different system of causes and influences. As Tilly (2002:39) puts it, “The actual causal structure of social processes… usually contradicts the logical and causal structure of standard stories.” Indeed, rather than being shaped by empirical *generalities*, our subjective understanding of the social world is largely informed by narrative *particularities*, our own pasts, the experiences of specific friends or relatives, gossip overheard about neighbors or coworkers (Ewick and Silbey 2003; Shore 1998). Collective narratives, in turn, require a different type of support to be affirmed and adopted than do empirical claims; Bruner writes:

> Unlike the construction generated by logical and scientific procedures that can be weeded out by falsification, narrative constructions can only achieve verisimilitude. Narratives, then, are a version of reality whose acceptability is governed by convention and ‘narrative necessity’ rather than by empirical verification and logical requiredness” (1991:4).

**Collective Narratives and Social Action**

At the same time, narratives are understood as influential in shaping people’s perceptions, decisions, and actions. As Bruner (2004:694) writes, “Eventually the culturally shaped cognitive and linguistic processes that guide the self-telling of narratives achieve the power to structure perceptual experience, to organize memory, to segment and purpose-build the very ‘events’ of a life.” Tilly (2002:27) describes how “standard stories” influence not only individual lives but also larger patterns of action, “cementing people’s commitments to common projects, helping people make sense of what is going on, channeling collective decisions and judgments, spurring people to action.” As Somers (1994:614) describes, “people are guided to act in certain ways, and not others, on the basis of the projections, expectations, and memories derived from a multiplicity but ultimately limited repertoire of available social, public, and cultural narratives.”

Recently, researchers have sought to understand how population dynamics are patterned by shared cultural meanings (Allendorf 2013; Johnson-Hanks 2002; Johnson-Hanks et al. 2011; Morgan
This work offers a fresh alternative to the classical view of population processes as reflecting independent rational-choice decision-makers (see also Thornton 2005), and theorizes that cultural schemas and narratives influence the situations people find themselves in, the options they imagine possible, and the ways that others intervene into their lives. As such, “causal properties operate at multiple levels” and population dynamics cannot be understood as the simple aggregation of individual-level covariates, but rather reflect the convergence of individual cognitive processes, shared narratives, and emergent social interactions (Johnson-Hanks et al. 2011:25).

However, we cannot understand the role played by cultural materials in shaping demographic processes without attending to the underspecified nature of our theories connecting cultural meanings and actions. The research summarized here has established that collective narratives are widely shared within populations, and that narratives influence both individual and collective behavior. Yet narratives are routinely found to be inconsistent with, even directly contradicting, the typical patterns of behavior that can be gleaned through systematic empirical analyses. If empirical patterns are aggregations of individual actions, carried out in reference to shared narratives, then how can these narratives persist in being simultaneously divergent from and constitutive of aggregate behavioral patterns?

Merton's concept of a self-fulfilling prophecy provides additional theoretical scaffolding for this endeavor. Merton (1948:195) defined the self-fulfilling prophecy as “a false definition of the situation evoking a new behavior which makes the originally false conception come true.” In a recent formulation of this theory, Biggs (2009:295) adds an additional criterion: that individuals involved must misinterpret or “misapprehend” the causal sequence and assume that the belief simply reflects (rather than causes) reality.

This concept provides a useful framework for my purposes of exploring how cultural beliefs are simultaneously constitutive of and divergent from behavioral patterns. Indeed, Biggs (2009:311) writes:

[This] emphasis on misapprehension underlines the importance of ‘folk sociology,’ how social actors themselves understand the causal processes which lead to their action and which flow from it… Analytical sociologists typically wield Occam’s razor to whittle the individual actor down to the simplest decision function. Sometimes explanation requires a more complex—and admittedly less analytically tractable—notion of the individual actor as someone whose own (mis)understanding of social process has to be taken into account.

However, as currently specified and empirically applied, the theory of self-fulfilling prophecies remains focused on the actions and perceptions of discrete individuals, and therefore does not offer
much leverage for examining the intersection between collective understandings and aggregate behavioral patterns. Despite recognizing that self-fulfilling prophecies operate at various levels, from individuals to groups, from collective actors to social theories, Biggs’ description of the mechanisms through which such beliefs become manifest is mostly limited to rational evaluations by individuals (note also Biggs’ emphasis on “the individual actor” in the previous quote). This is likely due to the fact that self-fulfilling prophecies are exceptionally difficult to analyze empirically; thus our knowledge of such processes remains thin 60 years after Merton first introduced this concept (Biggs 2009; Salganik and Watts 2008). Most extant studies focus on experimental evidence, where the objects of study are typically placebo effects (e.g.: Shiv, Carmon, and Ariely 2005; Stewart-Williams and Podd 2004) or questions of popularity or taste (e.g.: Salganik and Watts 2008; Sorensen 2007).

These experimental settings offer scant insight into the collective dynamics at the heart of both shared narratives and behavioral patterns. Cultural narratives circulate within communities, and are deployed to make sense of patterns of outcomes. In this article, I show how these narratives influence not only individual actions but also guide people to behave in ways that enable and constrain the actions of others. Only by collecting data on both types of processes, in dialogue with each other, can we hope to understand how collective narratives can be both imperfect representations of empirical processes as well as causal mechanisms underlying aggregate trends.

BACKGROUND ON SEX AND SCHOOLING IN AFRICA

Prior research in sub-Saharan Africa has consistently found that sexual activity is associated with school leaving for female students, though typically no significant association is found for male students (Biddlecom et al. 2008; Clark and Mathur 2012; Eloundou-Enyegue 2004; Meekers and Ahmed 1999; Mensch et al. 2001). The first published study to examine the sequential timing of sexual debut and schooling exit in sub-Saharan Africa used retrospective data on the timing of first sex and schooling exit from a survey conducted in four countries: Burkina Faso, Ghana, Malawi, and Uganda. In three out of the four countries examined, female students who are sexually active are more likely to leave school. In Malawi, girls who had premarital sex face almost twice the odds of leaving before completing secondary school (Biddlecom et al. 2008), For boys, relationship status was significantly associated with leaving school only in Uganda.

In the most detailed study to date to examine the associations between sexual experiences and schooling outcomes, Clark and Mathur (2012)(2012) use detailed relationship history calendar data from Kenya to show that women’s risk of leaving school increases when they report having had more partners:
with three or more sexual partners have more than nine times the risk of leaving school compared to their peers who reported no partners while in school; respondents who report one partner are also found to have a significantly higher risk of school leaving. Like the Biddlecom et al. (2008) study, Clark and Mathur find no significant association between number of partners and schooling exits for men.

The Clark and Mathur (2012) study also provides evidence that pregnancy is an important mechanism through which relationships lead to school exits: after controlling for whether or not women were ever pregnant, only respondents who report having had three or more partners have a significantly higher risk of leaving school. Other research on the effect of pregnancy has been more mixed. In Cameroon, Eloundou-Enyegue (2004) finds that pregnancy-related dropouts constitute a significant proportion of the gender gap in schooling attainment: one third of all schooling exits among female secondary school students are attributable to pregnancy. In contrast, out of 243 female out-of-school youth surveyed Kenya, only 4 listed pregnancy as their reason for leaving school (Mensch et al. 2001), and an analysis of five francophone countries in Africa shows that pregnancy accounts for at most 10% of female school departures (Lloyd and Mensch 2008).

In addition to these quantitative analyses, the cultural model of sex endangering schooling outcomes is relatively well documented through qualitative studies (Frye 2012; Grant 2012; Munthali et al. 2006; Poulin 2007; Stambach 2000; Wight et al. 2006). Wight et al. (2006:990) describe “pupil abstinence” as among the “most fundamental sexual norms” in Northern Tanzania; this norm is particularly salient for adolescent girls. Using in-depth interviews with parents, Grant (2012) shows that pregnancy in particular looms large in the cultural imaginary of rural Malawi. Poulin (2007:2391) describes how some female students in Malawi forswear dating altogether, citing concerns that boyfriends might “disturb their education.” And Frye (Frye 2012) theorizes that young women claim ambitious aspirations in part as a claim to the moral identity that comes with being a schoolgirl, one built around female purity and sexual restraint.

The current study builds on this prior work in several domains. Unlike prior research that relied on retrospective accounts, I use longitudinal survey data to examine prospectively how changes in relationship status affect the risk of leaving school over time. These detailed data also allow me to examine changes in school performance and absenteeism, as well as to use robust measures of pregnancy including self-reports and pregnancy tests administered every four months throughout the survey period. I also take a more in-depth look at the cultural schemas opposing sex and schooling, examining both the mechanisms through which relationships are believed to lead to schooling exits and the specific ways that individuals structure their behaviors in reference to these shared beliefs. More broadly, this study is the
first to examine the statistical patterns and cultural models in tandem, which allows me to show that these cultural understandings are both inconsistent with and constituent of the aggregate-level association between relationships and leaving school for women in Malawi.

**STUDY CONTEXT**

Throughout sub-Saharan Africa, patterns of educational attainment and adolescent sexual activity have changed rapidly in recent decades: youth now stay in school longer (Lloyd 2006) and more sexual debuts occur outside of marriage (Mensch, Grant, and Blanc 2006). Malawi in particular has experienced dramatic changes in both domains. In 1994, Malawi became the first country in sub-Saharan Africa to abolish primary-school fees; the total number of students registered in primary schools increased from 1.9 million in 1993 to 3.1 million in 1994 (Al-Samarrai and Zaman 2007). Although attrition remains alarmingly high (UNESCO 2008), enrollment has increased substantially for adolescents as well since this policy was enacted: between 1992 and 2010, the proportion enrolled in school rose from 66% to 90% for youth aged 10-15 and from 36% to 51% for those aged 16-20 (NSO-Macro 1994, 2011). The timing and context of first sex has changed as well; Malawian youth are substantially more likely to experience first sexual intercourse outside of marriage than were previous generations (Mensch et al. 2006). And between 2000 and 2010, the median age at first sex for young adults aged 25-29 increased by about a third of a year for both genders and the proportion aged 15-19 who reported never having sex rose from 43% to 56% for women and from 39% 46% for men (NSO-Macro 2001, 2011).

This study is located in the southern region of Malawi, where HIV/AIDS prevalence is highest; about 15% of the population aged 15-49 in the southern region was infected as of 2010, compared to 8% in the central region (NSO-Macro 2011). Southern Malawi has also historically experienced lower levels of educational investment compared with the other two regions (UNESCO 2008). Many areas of this region are majority Yao, a predominantly Muslim ethnic group that was relatively unaffected by Christian missions, who provided all education until the 1960s and continue to fund and oversee a large proportion of schools (Banda 1982; Salanjira 2009). As Kendall (2007:299) describes, this weak historical presence of schools in Southern Malawi led families and students to respond with less interest to the 1994 policy and to view schools as peripheral to their lives.

The data were collected in Balaka, a rapidly growing peri-urban community and major transportation hub between the cities of Blantyre and Lilongwe. Balaka is distinct from most areas of the Southern Region in its longer history of local engagement with formal education. Balaka itself is predominantly Christian, and has experienced several decades of intervention by multiple Catholic
missions. As the district capital, Balaka houses an elite government secondary school and is therefore a primary destination for local high-achieving youth.

**ANALYTIC APPROACH**

This research project is designed to examine the ways that narratives and statistics inform and condition each other; thus it requires a recursive methodological approach. I move between longitudinal survey data and in-depth interviews throughout this paper. The data were intentionally constructed to allow the two types of sources to be analyzed in tandem: the longitudinal survey spans the years in which the interviews were conducted, the in-depth interviews with students were purposively sampled from the survey data, and those with teachers were selected from the schools that respondents report attending.

I begin by establishing evidence that female students in sexual relationships are more likely to leave school. Next, I turn to the interviews to investigate the most salient folk theories or narratives that Malawian teachers and students use to understand why relationships are linked to leaving school. Returning to the longitudinal data, I then examine whether the mechanisms advanced in these collective narratives help to explain the statistical relationship between sexual relationships and later school leaving, and show that the results of the regression models remain significant after adjusting for these posited mechanisms. I conclude by returning to the interviews and highlighting the various ways that individuals’ actions and decisions are made in reference to the collective narratives, and argue that these behavioral responses help to sustain the aggregate pattern of sex leading to school leaving. While I present the results of these two sets of analyses in this dialogic manner, for the sake of clarity I discuss the two methods separately here.

**Statistical Analysis**

**Data**

The quantitative data used in this study come from from Tsogolo la Thanzi (TLT, Chichewa for “Health in Future”), a longitudinal survey administered in Balaka, Malawi between 2009 and 2012. TLT followed a random sample comprised of 1,504 women and 552 men aged 15-25. Respondents reported every four months for follow-up, allowing for an in-depth look at how relationship dynamics and schooling trajectories unfold over time (see Appendix 1 Table A1 for details about survey timing and attrition).

The analytic sample is limited to respondents who were in school at the beginning of the survey (N=843). I rely on slightly different subsamples when examining absenteeism, school performance, and
pregnancy (see Appendix 1 Table A2 for an overview of the exclusion criteria and descriptive statistics). Most of this variation is due to differences in the survey waves from which the variables of interest were drawn; attrition and school leaving reduce the sample in predictable ways.

**Models**

I use a combination of fixed-effects and propensity-score models to explore whether the significant bivariate association between sexual relationships and school leaving remains after controlling for selection. Because they compare observations over time for the same individual rather than focusing on differences between individuals, fixed-effects models remove all observed and unobserved variation between individuals that remains stable over time, such as intelligence, attractiveness, or early childhood experiences (Allison 1994; see Appendix 2 for more information regarding the regression equations). Because leaving school is a non-repeated event, I examine school exits over time using the “case-time-control” method, which allows one to include variables that change monotonically over time using the fixed-effects approach (Allison and Christakis 2006). This method takes advantage of the symmetry of odds ratios for dichotomous variables in conditional logistic regression models, and involves reversing the dependent and main independent variable of interest (Allison 2009).

Fixed-effects models present some limitations, however. This approach renders researchers unable to examine the effects of time-invariant measures. Further, respondents who experience no change in the outcome are removed from the sample. For the models predicting leaving school, this reduction in sample size is substantial. To supplement the fixed-effects models, I estimate propensity score models examining the effect of being in a relationship at wave one on leaving school between waves one and six. The propensity scores are generated using the inverse conditional probabilities from a logistic regression model predicting sexual relationship status (Lunceford and Davidian 2004; Morgan and Winship 2007). The “doubly-robust” approach includes the propensity scores and the regression model in the same estimator, and has been shown to offer a more efficient strategy than earlier propensity-score approaches (Bang and Robins 2005 for equations, see Appendix 2).

To examine whether the mechanisms emphasized in the interviews account for the associations between relationships and leaving school, I use a similar combination of bivariate and multivariate approaches. For absenteeism and school performance, I explore whether students who are in a relationship are more likely to experience these outcomes than single students, and then examine whether these variables mediate the association between relationship status and leaving school. For pregnancy, because students who are in a relationship are necessarily more likely to become pregnant than are single
students and thus these variables are collinear, I pursue a different approach. I examine the proportion of premature school departures that are attributed to pregnancy, and then examine whether the association between relationship status and leaving school remains significant when respondents who experienced a pregnancy are removed from the sample.

I estimate all models separately for male and female respondents, for both substantive and statistical reasons. Substantively, adolescent sexuality is fundamentally gendered, and we can expect relationships to have different effects for male versus female students. Statistically, scholars have raised concerns about interpreting interaction terms in logit models (Ai and Norton 2003; Long and Freese 2006), particularly for fixed-effects and other panel models (Karaca-Mandic, Norton, and Dowd 2011).

Variables

To examine school leaving, I use the question “Are you currently enrolled in school?” which is asked at each wave of the survey. For absenteeism, I use “Were you absent from school any days last week?”, also asked at each wave. To examine school performance, I use two measures: self-reported end-of-year examination scores for mathematics and English, collected during wave four, and a more general question, asked in all waves: “In the last four months, did you have trouble in school?” I identify a respondent as having experienced a pregnancy while in school through combining three different measures: (1) listing pregnancy in response to the question “What is the main reason you stopped attending school?” (2) reporting a pregnancy either before or during the same survey wave in which the respondent reports leaving school (question: “Are you pregnant right now?”), or (3) testing positive for pregnancy either before or during the same wave in which the respondent reports leaving school (pregnancy tests were offered to all female respondents at every wave of the survey).

To measure whether or not a respondent is in a relationship, I use a dichotomous measure that distinguishes between students reporting at least one current sexual partner and those who do not report any sexual partners. I also conducted the same set of analyses using two alternative specifications: the first is more restrictive and considers only respondents who report having a committed sexual partner, and the second is less restrictive and includes all current romantic partners, whether sexual or nonsexual. The basic findings were the same, though including nonsexual romantic partners tended to dilute the significance of the effects (results available upon request).

The fixed-effects models control for the following time-variant measures: socioeconomic status, year in school, employment status, the respondent’s estimated likelihood of remaining in school, and whether the respondent experienced difficulty paying school fees and/or declining health in the four
months prior to being interviewed. The doubly-robust models control for socio-economic status, age, level in school, respondents' satisfaction with her current schooling level, and two measures of expectations for future educational attainment, all measured at wave 1 of the survey.

**Interview Analysis**

**Data**

The in-depth interviews were designed to complement the survey data, and include 38 interviews with secondary school teachers from seven schools that respondents attend, collected in 2009, and 57 interviews with in-school and recently out-of-school survey respondents, collected in 2011. I conducted the teacher interviews in English, and transcribed each interview shortly after it was completed. At each school, I interviewed the headmaster, the deputy headmaster, the life skills teacher, and up to three other teachers. 28 teachers were interviewed, with 10 follow-up interviews, totaling 38 interviews.

The youth interviews were conducted in Chichewa, the dominant language spoken in Balaka, by a team of four Malawian interviewers. Youth respondents were selected from a stratified sample based on their responses to questions about educational experiences, targeting respondents who were still in school (N=24) and those who left school during the year preceding the in-depth interview (N=33). The adolescent sub-sample includes 30 female and 27 male respondents. All interview respondents quoted are given pseudonyms from a list of common Malawian names.

**Analysis**

In analyzing the qualitative data, I first focused on the salient mechanisms through which sexual relationships are believed to negatively impact educational outcomes. I read all interviews at least three times, and coded them using the Atlas.ti qualitative coding software platform. I began by coding all sections discussing either sexual relationships or schooling experiences, generating a preliminary list of general themes. I then read these coded passages again with the intention of identifying the most salient narratives linking sexual relationships and educational trajectories.

I later returned to the interviews to help elucidate the major findings from the survey data. This time, rather than paying attention to the narratives explaining how relationships generally affect educational outcomes, I looked for descriptions of individuals engaging with or responding to these narratives. I reread the interview transcripts and coded all descriptions of relevant actions by teachers, parents, and students. I then selected textual examples reflecting the most typical patterns of behavior. Anonymized interview transcripts and a detailed coding scheme are available upon request.
RESULTS

1: The Statistical Association Between Sexual Relationships and Leaving School

Table 1 presents the results of a bivariate comparison of rates of leaving school by relationship status, with the data aggregated into person-waves. This difference is significant for both genders but is much larger for women; while only five percent of the person-waves in which female respondents report being single are followed by a school exit in the subsequent wave, this proportion is over twenty percent when female students report relationships. For men, these proportions are five and eight percent, respectively.

Table 2 presents respondents’ schooling and relationship statuses as they unfold over time, and shows that students who begin the survey period in a relationship are more likely to leave school by the end of the study period two years later. This comparison is particularly striking for female students: 66 percent of female students who begin the study in a sexual relationship have left school by wave six, compared to only 35 percent of those who start out single. This table also shows that having a relationship while in school is an unstable status—most students do not remain in this category four months later, but either end their relationship (the most common pathway) or leave school.

The top panel of Table 3 shows the results of case-time-control models exploring how changes in relationship status and other time-varying characteristics predict leaving school. Women are highly significantly more likely to leave school after entering into a relationship (p<0.001); for men, there is no significant association between changes in relationship status and leaving school. The results of the doubly-robust models, presented in the bottom panel of Table 3, confirm the findings from the fixed-effects models. With all variables included, female respondents who were in a relationship in wave 1 are 22% more likely to end the observation period out of school (p<0.01). The second column shows no significant effect of being in a relationship for male students.

Comparing the results of the doubly-robust models to the descriptive statistics from Table 2, we can determine the degree to which the difference in likelihood of leaving school by relationship status is attributable to selection on the characteristics included in the propensity score models. Table 2 shows that women who begin the study in a sexual relationship are 33% more likely to leave school by wave six compared with those who begin the study with no sexual partner. When we examine the predicted
probabilities in Table 3, this difference in the probability of leaving school is reduced to 22%, an attenuation of one third. For men, Table 2 shows that men reporting sexual partners at wave one are 11% more likely to leave school with no adjustment for selection; this difference in probability is reduced to 6% in Table 3, an attenuation of 45%.

2: Overview of the Schemas and Narratives Linking Sexual Relationships and Leaving School

To understand this aggregate association, a logical first place to turn to is people’s own accounts of why sexual relationships so often lead to school leaving. Here, I briefly describe the cultural schemas and collective narratives that were expressed in the interviews; a more detailed discussion of the interview data follows. The interview evidence reveals two related cultural schemas—the antinomy of sex and schooling and girls’ heightened vulnerability to sexual temptation. When describing why students in relationships tend to leave school, or when discussing a specific case of suspected or confirmed sexual misconduct, most interview respondents referenced one or more of a group of three collective narratives that describe how students are negatively affected by their sexual exploits: they are tempted to skip school to be with their partners, they are distracted and cannot learn, and they become pregnant and are forced to leave school. These schemas and narratives are summarized in Figure 1.

[Figure 1]

Schemas Opposing Sex and School and Emphasizing Girls’ Vulnerability

When describing how sexual relationships threaten scholastic success, interview respondents repeatedly emphasize how sexual activity is incompatible with educational pursuits and will “ruin” students’ academic ambitions. This opposition was often invoked through the phrase: “You can’t feed the heart and the brain at the same time.” The antinomy of sex and schooling was mentioned in all but 2 of my interviews with teachers, and in the majority (over 70 percent) of my interviews with students. Often, the topic was introduced by the respondent in response to general questions such as “What are the most important issues that you face in trying to teach students in your classroom?” The consistency with which interview respondents mentioned sexual relationships as a threat to further schooling, and the primacy that this issue holds in their broader understanding of what determines educational success or failure, suggests that the opposition between sex and schooling is an important cultural schema in this context. This schema is an abstract, open-ended framework that entails a negative association between these two domains in people’s minds. If a person is a student, he cannot have sex. If a person is sexually active, she cannot be a student, at least for long.

These statements often particularly referenced female students, with declarations such as “you
know, girls, they are weak” (interview with Mr. Banda, English teacher at small private school).

Adolescent women are portrayed as craving attention and positive affirmation, greedy for money to spend on clothes and beauty products, and consumed with dreams of getting married and having babies. This passage from my interview with Mrs. Mwanza illustrates this emphasis on girls’ weakness in the face of sexual desire:

Mrs. Mwanza: Sometimes girls they can be a bit naïve. They can be told something, then they just follow what the friend is doing which is not good... Now, this girl, if she is not helped, when she grows at this age, there is a tendency to seek that love that she needs... So now, where does she get it? She can get it either from the friends, or sometimes now these days she can get it from the boy... In that case you find that a girl is weak in studies.

Such statements echo the broader conception of women’s sexual vulnerability that has been observed elsewhere in Malawi (Schatz 2005; Watkins and Swidler 2013). This gendered schema overlaps with the schema opposing sex and schooling, and leads teachers and students to perceive relationships as a particularly potent risk for female students.

Three Collective Narratives Explaining Why Sex Leads Girls to Leave School

When explaining why sexual relationships inevitably lead students (particularly girls) to leave school, teachers and students typically drew from a stock of three narratives, which refer to different mechanisms through which relationships trigger negative changes in students’ behavior or abilities and render them unfit to be students. The first mechanism through which sexual relationships are commonly described as leading to school leaving is absenteeism. Since many students live with relatives who forbid sexual relationships, class time is often described as the best opportunity to spend time with a partner. Several teachers mentioned noticing that two students were often absent on the same day as one way of detecting relationships. As Mr. Banda, a composition teacher at a small private school, describes:

Mr. Banda: They may decide not to be in class for some time, going out for other issues with their boyfriend. And we keep observing this particular behavior continues, and sometimes we can notice that this girl is always absent from class on the same days as this boy, and then we suspect that something is happening.

Students also mentioned school absence when discussing how relationships affect educational experiences. Simon, a 20-year-old student who just wrote his form-four exams, explains in language typical of many other respondents how missing school caused him to perform poorly. In this passage, Simon is describing how he once had a girlfriend for a few days, but broke up with him after receiving advice that his relationship might affect his educational prospects.

Simon: My other friends were warning me, I realized that their advice is true and this will mess
me up, will disturb my education.” And I just quit.  
I: So how did you tell her when you went to tell her it was over?  
Simon: I just told her that, “If I will be doing this with you, I will end up not going to school and learning the lessons. So it is better that we should separate so that you should work hard in school and I should also work hard in school.” [...] Because if I can have an affair with person, it means that most of the times I will be seeing her and I will not be able to do other things. And also, maybe in the process, she will entice me with different romantic cunning and then I will not be going to school.

The second way that sexual relationships are described as causing students to leave school is through distracting thoughts affecting academic performance, often expressed by teachers in terms of a fundamental biological incompatibility between education and romantic love. Mr. Chomba, an English teacher at a large government school, states, “We know that when you mix the two, one thing will definitely suffer, especially their studies. At this age, with their bodies and brains still developing, they don’t have control over their sexual impulses.”

This belief that sexual partners muddy concentration and lower academic performance was also expressed during interviews with school-aged youth. Charity, who is 16 years old and in standard 7, explains in language typical of many other respondents how being distracted by a relationship would cause her to perform poorly in school by “disturbing her thoughts”:

I: Would you like to be in a relationship right now?  
Charity: No  
I: Why?  
Charity: Those things will distract my education. It might be that I cannot be thinking about school and be thinking about him so it can disturb my thoughts. I am working on the school matters while he can be telling me about the things that are not about school so it can be different so my thoughts cannot be achieved.  
I: He can be telling you the things not about school like what?  
Charity: Like about love, about having sex.

The third way that sexual relationships are said to detrimentally affect schooling outcomes is through pregnancy leading girls to leave school. When teachers suspect that a student is pregnant, she is taken to the hospital for a pregnancy test, and asked to leave school immediately if the test is positive. Although a nationwide policy requires schools to allow students to return a year after giving birth, teachers and students both report that few students do. Tawonga, an 18-year-old who became pregnant while in her first year of secondary school, describes her experience:

Tawonga: It did not take much time for the relationship to reach its maximum point, the point of no return, when we started having sex together, and that is when I got pregnant and now I can see that the advice [my sister] gave was true. I have disturbed my education, and even though my mother agreed to watch the baby, my brother has refused to pay for my
school fees again, saying that he can't trust me and maybe it will happen again. While Tawonga describes her mother and teachers encouraging her to return to school, her brother refused to pay her fees, and as a result she remained out of school.

3: Quantitative Analysis of the Three Collective Narratives

Relationships Tempt Students to Skip School to Spend Time with their Partners

The second row of Table 1 shows that male students with sexual partners are significantly more likely than those who are single to report having been absent from school (p<0.001). Forty percent of the time, male students who report being in a relationship missed school in the previous week, while for single males this is true only thirty percent of the time. Among female students this difference is only three percent and is marginally significant (p<0.10). In supplementary analyses, I use fixed-effects models to test whether this association for male students remains after adjusting for selection (Appendix 1, Table A3). These results show that men who begin a sexual relationship face one and a half times the odds of being absent from school in the following wave (p<0.05). There is no association between changes in sexual relationship status and reported school absence for women in these models.

In Table 4, I test whether controlling for school absence mediates the association between relationship status and leaving school for female respondents in the case-time-control models. The first column of this table shows that when a lagged variable for school absence is added to the model, the odds ratio corresponding to relationship status remains 2.98, the same as reported in Table 3. Together, these results suggest that absence is not a major mechanism linking relationship status and leaving school. Rather than being a pathway through which relationships lead girls to leave school, absence from school appears to be a parallel process through which relationships alter educational experiences for male students, albeit with less severe consequences.

[Table 4]

Relationships Make Students Distracted and Unable to Learn

Table 1 shows that there are no significant differences in any of the measures of school performance (end-of-year examination scores in Math and English and whether a respondent reports having “trouble in school”) between those who are in a sexual relationship and those who are not. To ensure that other factors are not masking the effect of being in a relationship, I also conducted multivariate analyses for both measures of school performance (Appendix 1, Tables A4-A5). As expected from the null findings at the bivariate level, there are no significant associations between relationship status and academic performance in any of these models.
To examine whether school performance mediates the association between relationship status and leaving school for female students, I added a lagged measure of having trouble in school to the case-time-control models presented in Table 4.\textsuperscript{15} Adding this variable has no effect on the size of the coefficient for relationship status: the odds ratio changes from 2.98 to 2.96. These findings suggest that the association between relationship status and leaving school does not operate through academic performance, when measured using examination scores as well as subjective perceptions of having trouble in school.

\textit{Relationships Lead to Pregnancies and Subsequent Removal from School}

To explore the extent to which the association between relationship status and leaving school for female students operates through pregnancies, I first examine the reasons given for leaving school among those who did so between waves two and six (Table 5). Almost one third of female respondents (29\%) who reported leaving school attribute their departure to pregnancy, and an additional 7\% cite marriage as their primary reason for leaving school. This table indicates that unlike absenteeism and lowered school performance, pregnancy does indeed appear to be a significant pathway through which relationships interrupt schooling trajectories for women of this age range.\textsuperscript{16}

[Table 5]

To investigate the extent to which pregnancy cases attenuate the statistical association between relationship status and school leaving for female students, I repeated the case-time-control and doubly robust models predicting school leaving, with the analytic sample restricted to female respondents who did \textit{not} experience a pregnancy while enrolled in school.\textsuperscript{17} These results are presented in the third column of Table 4. In both the fixed effects and doubly robust models, sexual relationship status remains a significant predictor of leaving school for this “non-pregnant” subsample, though the magnitude of the effect is reduced. The results of the fixed-effects model tell us that respondents who are in a relationship face more than twice the odds of leaving school among this restricted subsample. The doubly-robust results show that female respondents who begin the survey in a relationship are 15\% more likely to have left school two years later, among those who do not experience a pregnancy. The association between relationships and leaving school is only partially attenuated by removing pregnancy cases; women with sexual partners are still more likely to leave school even if they don’t get pregnant.

To summarize, the results presented in this section show that the elevated risk of leaving school that female students face if they have a sexual partner does not appear to operate through increased absenteeism or lowered school performance, and pregnancies do not fully explain the observed pattern
either. The results also provide evidence of gender dissimilarities in the effects of relationships on educational outcomes: women (but not men) are more likely to leave school if they have a sexual partner, while men (but not women) are more likely to be temporarily absent.

4: Behavioral Responses to the Cultural Antinomy of Sex and Schooling

I now return to the qualitative evidence to make sense of these findings. I argue that rather than relationships detrimentally affecting students’ capacity to learn or attend school, the cultural antinomy between scholastic success and sexual behavior is itself a key element in the causal story linking these two domains in the lives of students. As with any survey, the TLT data show patterns produced by people behaving in reference to shared meanings and moral standards. The cultural schema linking sexual behavior with school leaving percolates through the decisions and actions of teachers, parents, students, and out-of-school youth. It shades their evaluation of the consequences of a course of action, and colors their judgments about other people.

This section presents some of the ways that Malawian teachers, parents, and students attend to the cultural opposition between sex and schooling. Throughout the interviews, I found examples of people referencing the collective narratives when explaining their behavior. Interview respondents also describe themselves preemptively responding to situations involving sexual relationships between students, before any of the specific mechanisms posited in the narratives become apparent. As I will show, these constellations of decisions and responses help to sustain this opposition in the lives of Malawian youth. It is against the backdrop of this cultural antinomy that students’ educational pathways unfold.

Teachers

When describing the perils of student relationships, teachers often invoke the three mechanisms described above: absenteeism, poor academic performance, and pregnancy. But, consistent with the general schema opposing sex and schooling, their school policies prohibit all “romantic pairings,” regardless of whether or not any deleterious effects are observed. Indeed, when asked what they would do if a high-performing student were caught having a relationship and her classroom behavior did not change, most teachers declared that they would still punish her. As Mr. Banda states:

I: If a relationship is happening between two students, but it is not affecting their performance in class, is it a problem?
Mr. Banda: We have school rules and regulations that clearly state no relationships in school. So being a student, even if we can’t say the relationship is actually affecting their performance, of course it is still against these rules and regulations.

Some teachers, like Mr. Mkandawire, a biology teacher at a large public school, were unable to fathom that a student could maintain a relationship and not have her performance affected, revealing the extent to which their judgments are influenced by the moral panic surrounding schoolgirl relationships:

I: Does it make a difference with this type of situation if a student is a very good student or if they are getting very good marks, and have good behavior, would you still punish them?

Mr. Mkandawire: But that doesn’t happen. If a girl is in school and you find that she has involved herself in a romantic pairing, definitely her behavior starts to suffer. She will have her mind wandering towards this boy, and she will stop performing well.

This unwavering belief in the ill effects of relationships leads teachers to act swiftly in punishing students, often intervening before academic or behavioral changes are detected. Teachers described this type of preemptive punishment in all schools I visited. For example, Mr. Kumbuyo, a math teacher at a large government school, describes how teachers initiate the disciplinary procedure immediately upon seeing a student walking with a partner outside of class:

Mr. Kumbuyo: Sometimes we see that something is happening that is not academic. Like maybe outside of this school we can meet them, walking with their boyfriend or with their girlfriend…We tell them that tomorrow you come to the office. And we ask them to write what happened, and that teacher will be a witness. And if it is true that there was something between them, this is sufficient cause for suspension.

Teachers like Mr. Kumbuyo are acting in accordance with the pervasive belief that students cannot succeed in school if they are sexually active. Their punitive actions in turn reinforce this model by creating real obstacles for students’ efforts to continue their education. A suspension often means a repeated year in school, as students are barred from taking compulsory exams or miss crucial lessons. Taziona, a 19-year old woman who left standard 8 one year ago, describes how such disciplinary actions resulted in her being held back:

I: What obstacles have you encountered at school as you were trying to continue?

Taziona: A boy proposed to me and the relationship became very famous, until even the teachers had heard about that story. They called me at the office… It was not agreed upon by me and that boy. I refused that, “I am being falsely accused. The boy proposed but I did not accept him.” But they called upon the boy, and he accepted that, “She is really my girlfriend.” So you can see there that his thoughts and mine differ there… And we both had to go home for a month, so that caused me to repeat the year.

While Taziona returned to school the following year, suspensions and other disciplinary actions that take students out of the classroom place additional hurdles on the long road that youth in
Malawi travel to complete their education. Though they are just one element in the cultural landscape linking sex and schooling, these preemptive punishments by teachers likely contribute to the pattern of girls leaving school after becoming involved in sexual relationships, even without detectable changes in their attendance or performance.

**Parents**

Parents also act in reference to this schema. Although the 1994 policy eliminated school fees at the primary level, sending adolescents to school still requires significant financial investments from parents, including secondary school fees, uniforms and supplies, and foregone wages. Parents are hesitant to make these investments if they don’t expect their children to graduate, and recent research shows that these evaluations are influenced by whether they believe their children to be sexually active; “Rather than focusing on their potential inability to cover the costs of school expenses or the low likelihood that their children will find future employment, parents choose to focus on their daughters’ sexual activity as endangering their schooling prospects” (Grant 2012:79). In my interviews, parents are described as being extremely concerned about the sexual comportment of their children (particularly their daughters), with their financial support contingent on their children’s abstinence.

Most teachers I interviewed described parents as allies in regulating students’ sexual behavior. For example, Mrs. Mwanza, the deputy headmistress at a girls’ Catholic boarding school, describes her relationship with parents:

**Mrs. Mwanza:** In most cases you find that the parents are siding with you. Whatever you are trying to discourage in the students the parents are also strictly discouraging that.

**I:** Have you ever spoken to a parent about this issue of sexual relationships and had the parent be ok with knowing that her daughter was in a relationship?

**Mrs. Mwanza:** No, they are so much against that, almost slapping the girl.

Teachers described this support from parents as vital to their efforts to monitor students’ sexuality. Indeed, in three separate cases, teachers mentioned parents coming to school to report evidence that a student was involved in a relationship.

Both teachers and students repeatedly mentioned the fact that parents may refuse to pay school fees if their children are sexually active. The threat of parental sanctions was described as giving students an incentive to avoid relationships; for example, Mrs. Lungu, a life-skills teacher at a small private school, reports that, “Girls, they are afraid of suspension because parents do not want to see them at home, they can stop paying the school fees. So they are more careful.” Brother Chirwa, a
headmaster at a co-educational Catholic school who took a more sympathetic view towards students, hesitates to involve parents in order to prevent students from losing financial support:

**Br. Chirwa:** First we call the girl and talk to her, only with the student. But sometimes a student will claim that I will not do this anymore, but you see it continuing. So then, you invite the parents.

**I:** And how do the parents normally respond?

**Br. Chirwa:** Normally it is really a joint venture. Most of the parents, they say thanks for your concern. But in rare cases, some parents when you call them like that they say I will not give you school fees anymore, because you are squandering my money. Or sometimes, they will say, you are no longer my child. So we avoid telling parents for that reason.

Parents pulling students out of school also came up in the adolescent interviews. Agness, a 17-year-old in her final year of primary school, describes how her cousin’s parents stopped paying her fees due to rumors about her sexual behavior, which Agness insists were false:

**I:** What circumstances lead a person to fail to achieve her educational goals?

**Agness:** People sometimes gossip, like they may go to your parents and say, “don’t pay fees for that one she is just wasting your money.” And sometimes they stop paying for you.

**I:** Does this really happen, just from gossip?

**Agness:** Yes, it happens, I’m telling you it happened to my cousin… Others were suspecting that she was having a sexual relationship. And they were saying don’t pay for her. But she wasn’t even having one.

**I:** Oh! Maybe she had it and you didn’t know! [Both laugh]

**Agness:** Maybe but she is my cousin from my home village and I believe her.

**I:** So what happened to her?

**Agness:** She just left it, what can she do.

It is notable that Agness mentions gossip about relationships in response to a general question about the circumstances that can lead people to fail to achieve their goals. Indeed, sexual relationships were more frequently mentioned in this context than poverty, which reveals the scope of the moral panic around this issue in Balaka.

Chisomo, a 19 year old who left school one year ago, describes how her brother responded when he feared that she was squandering his money for school fees by flirting with men:

**Chisomo:** [My brother] was insisting that I have done something while I haven’t done that thing. That time I went to a friend’s place to chat, a girl, so he liked following me, and when I was coming back from there I met a certain boy who greeted me…I stopped and greeted him then I went home and there wasn’t anything else that happened. So reaching there in the evening it is when he was asking me that you stood with a boy at that place, who is he to you? I said that there isn’t anything. So he beat me with electricity’s pipe. He was shouting that I was just trashing his money, and he kept on beating me.

Elsewhere in the interview, Chisomo stated that she had to leave school because the brother refused to continue paying her fees, due to his continued distrust in her sexual abstinence.
Because I interviewed teachers and young adults, the perspectives of parents and other relatives are captured only through second-hand reports. Yet these glimpses consistently depict parents as highly attuned to the romantic leanings of their children, particularly their daughters. Because they see any sexual behavior as inevitably leading to school failure, their financial support hinges on faith in their children’s abstinence. These responses from parents suggest another way that the deeply embedded belief in the antinomy between sex and schooling helps to sustain this antinomy in the lives of youth in Malawi.

**Students**

In the adolescent interviews, two contrasting framings of sexual relationships emerged. Some, facing insurmountable barriers on their way to graduation, deploy romantic relationships as a strategy to abandon their educational ambitions and pursue other avenues to adulthood. Others, holding tightly to their dreams of a better life through school but unwilling to forswear all romantic experiences, carefully construct relationships in opposition to this dominant cultural schema, partnerships they hope will help not hinder their scholastic pursuits. Despite their contrasting motivations and behaviors, both patterns reflect youth working to create a respectable adult life in accordance with the cultural schema linking relationships and school failure.

Educational credentials in Malawi are fervently desired, not only because of their economic benefits but also their social correlates: they speak to a young person’s honor and virtue (Johnson-Hanks 2006). Educational aspirations are also morality-laden, and students are expected to maintain optimism and dogged determination, even in trying circumstances (Frye 2012). Yet continued investment in school is costly, both financially and in terms of the consequences of staying in school for women’s marriage prospects, particularly as they advance in age (Lloyd and Mensch 1999; Quisumbing and Hallman 2005). When it becomes clear that graduation will remain an elusive dream, young people must move on and pursue other avenues to a secure adulthood. Because of the taken for granted antinomy between sex and schooling, interview respondents describe starting a relationship as a socially-codified means to abandon the quest for a diploma. While students who engage in sexual relationships are temporarily shamed by teachers, parents, and peers, after they have left school and the dust has settled, such sanctions typically fade. Having married and started families, these women have transitioned to an alternative life path, one that is socially acceptable and also offers a chance of financial security (if they manage to find a good husband).

Respondents who reported pursuing relationships as a way to leave school described prolonged
struggles to stay in the classroom. For example, Jennipher describes:

**Jennipher:** I was going to my school without eating... coming from there finding out that there is no flour... It was affecting so much because I wasn’t listening in class because I was hungry and also sometimes the teachers would send me out of the class because my clothes were dirty or no fees, so I stayed at home and missed school. This happened so many times.

Jennifer's struggles are typical in this context; students often lack money for food, uniforms or supplies, and other mandatory school-related expenses. Adolescent respondents often describe enduring these hardships for several years, coming to class when they can manage and missing long periods of instruction when money is scarce. This pattern is sustainable in the short term, as students are permitted to return to school. But in the long run, this staccato tempo does not bode well for progressing through secondary school. Frustrations often emerge around the three national-level examinations that are required to graduate from primary school, advance to senior secondary school, and complete secondary school. Lacking money for preparatory materials and having attended school sporadically, financially strapped students often fail. At these moments, students like Jennipher begin to waver in their commitment to staying in school, facing the prospect of repeating the same level. In these periods of frustration and reevaluation, relationships are often viewed as a way out:

**Jennipher:** I was feeling like there wasn’t anything good that would come of school, I was lacking so many things and when it came time for examinations I did not have money. And I was in standard 8, next would be [secondary school] fees, and there was no money for that. So I thought, let me just find a man. I wasn’t feeling hope about school, that is why I saw that I should better be having relationships.

In describing leaving school, women like Jennipher reference the cultural schema opposing relationships and education. Because the narrative logic underlying this schema implies that one cannot stay focused on school after entering a sexual relationship, pursuing a partner is akin to stepping away from education and towards more realistic visions of the future. Yet these women do not appear as weak and unable to control their desires; rather they describe themselves strategically deploying these collective narratives in order to embark on an alternative pathway to adulthood. No longer hopeful of becoming career women, these women work to become respected wives and mothers.

While they are subject to scolding and gossip in the short term, after they have left school and gotten married, they describe people generally accepting their new roles. Ruth describes meeting her teachers a few months after leaving school: “The other day I met my former teachers on the road, when going to town. They asked me why I am not coming to school, so I said that I have gotten married now... They accepted and they wished me all the best. Then they left and continued going
where they were going.” Chimwemwe describes a similar acquiescence from her parents when they
discovered she had started a sexual relationship while in school:

I: Ok what about your relatives, what did they do when they heard that you had a boyfriend?
Chimwemwe: they just came and said ok now you have started a relationship, you can’t be
just staying it is better that you should get married. At first, they were disappointed… But
then they just said all right, so you are with this man, you should get married, better to quit
school now and go with him. Soon we will eat chicken [reference to traditional wedding].

Because they view all relationships as necessarily leading to school failure, Chimwemwe’s parents
quickly move from expressing disappointment to ensuring that she marry her partner, so that she is
not left “just staying”— no longer in school but not married either. Indeed, as Tawonga describes,
“just staying” is a fate worse than marriage, lacking both the hopeful luster of studenthood and the
respectability of marriage:

I: Ok, so what do you think being married will mean in your life?
Tawonga: Being married will help me because when a person is married you are honored
rather than that you should not be married but you should have a child or just be staying at
home not schooling, it is shameful.

The adolescent interviews also revealed a counter-narrative, voiced by a minority of high-
achieving female students, of relationships built around encouraging and helping each other with
schoolwork. These relationships were explicitly contrasted with the dominant model of student
relationships, and the women described communicating their unique expectations to their partners.
For example, when explaining how her relationship started, Caroline, a 19 year old in Form 2, states:

Caroline: He started proposing to me that, ‘I need you, I love you.’ [Both laugh] So at first I
refused so many times, it really took a number of days before I accepted him.
I: Why were you refusing him?
Caroline: At first I thought that he just wanted an ordinary affair, so I was telling him that I
do not want an ordinary affair, I want a man who will wait for me to finish school and be
discussing ideas and helping me. So he said that, ‘so what is this, I thought I am proposing
this to you. I am in form 4 and you can see that we will be helping each other and giving
encouragement.’ So I saw that he is serious and I accepted.

Once she confirmed that this man was also not looking for “an ordinary affair” and would put his
studies first, she was willing to date him.

A key characteristic of this “school positive” counter-narrative is that when asked how they
spend time together, these women emphasize helping each other with school and “encouraging”
each other. Mary, a 21-year-old who was awaiting the results of her secondary school completion
exams at the time of her interview, describes seeing her partner “only at school, or maybe when we
were on break.” When asked what they did together, Mary replies:
Mary: We discussed about the future, and sometimes we were telling each other, “They were teaching us this and I did not understand.” Like geography was difficult for me, he was able to help me, and what he didn’t know he could tell me, “You should ask another person.” This does not mean that they are completely abstinent; indeed all women who expressed this alternative model reported having sex with their partners. But their physical intimacy is tightly controlled, and these women are vigilant towards any sign that the relationship might occupy too much time or attention. They describe their partners as willing at first to fulfill this alternative role, but becoming more demanding over time. At the first indication of such weakness, these women tend to end the partnership. For example, Chikondi describes how her partner’s increasing demands caused her to break up with him:

Chikondi: We stayed a while together, but the other month he stared saying, “I cannot have a relationship and just stay without having sex more often” Then I said that “Ah! I cannot manage so if it is like that, you can go and search for another person, because we agreed that school should come first.”

Indeed, out of five cases where women described this alternative model, only one [Caroline’s] was still ongoing. All others had ended things when their partners failed to meet their high expectations. These women are a small minority; this alternative model was described by only 5 of 32 female interview respondents. Yet this handful of women were articulate in their depictions and consistent in what they described, and their accounts shed new light on the statistical results described above. Specifically, this counter-narrative helps to explain two findings. First, it offers a theory for why women who have sexual partners and who remain in school are not more likely to report negative educational outcomes such as absenteeism, lower test scores, or trouble in school. Counter to the pervasive expectation that any sexual encounter will derail women’s educational trajectories, these women are able to maintain their success in school after beginning a relationship. And second, they help to explain why the status of “in school and in a relationship” is so unstable (Table 2). This counter-narrative is brittle; the women describe carefully monitoring their partners for weaknesses that might threaten their educational ambitions, and at the first sign that their partner wants more of an “ordinary affair,” the relationship is terminated.

The Gendered Nature of the Cultural Schema

A closer look at how individuals attend to the shared narratives about sex and schooling can also help us to understand why the effects of relationships on educational outcomes are so gendered, with boys more likely to be absent while girls face a heightened risk of leaving school. While sexual
relationships are thought to be damaging for all students, girls are believed to be much more vulnerable to the temptations of sexual relationships at this age. As such, female students are subject to considerably more scrutiny from parents and teachers than are boys. Almost all of the examples that teachers gave of students disciplined for being caught in a relationship concerned female students.

Teachers’ attempts to regulate the behavior of girls are often expressed as efforts to empower girls and free them from “cultural factors.” Mrs. Ngosa, headmistress of a girls’ Catholic school, states:

**Mrs. Ngosa:** Most of the young people when they enter into a relationship they run to sex. So this is how it becomes more dangerous. I can say many of the young girls fall into this because they have no skills. Their culture tells them you are a weaker sex so the boy has power over you. So you will find that to give in to sex, sometimes they will believe that this culture is stronger than me. No ability, no courage to say no.

Although they often invoke language of gender empowerment, the actions of teachers as they attend to this perceived weakness fall far afield from what Western observers would consider empowering: they strictly monitor girls’ behavior for signs of sexual desire and then punish them harshly. Watkins and Swidler (2013:205) describe similar behavior among staff in local AIDS organizations: “Despite the rhetoric of women's vulnerability, NGO brokers seek to restore moral order by suppressing vice, reducing temptation, and—especially—restraining women's behavior.”

Parents also seem to be particularly concerned with the sexual purity of female students. All descriptions of parents punishing students involved female students. In the following passage, Brother Chirwa alludes to parents’ heightened concern over their daughters’ sexuality:

**Interviewer:** So you invite the parents of the boy and the girl together?
**Brother Chirwa:** Usually it is just the girl, the girls they have more of these relationships than boy students do. And their parents become very serious in these cases, because they think the girl will just get pregnant.

Brother Chirwa’s depiction is consistent with recent evidence from interviews with parents, who “express a highly gendered perception of girls—but not boys—as unable to balance both a romantic interest and a focus on school” (Grant 2012:76).

This gendered cultural schema may enable male students to more successfully juggle school and relationships, thus helping to explain the gender differences in the statistical findings. Boys are not as carefully watched, thus they can more likely miss school temporarily without incurring harsh punishments. Girls are assumed to be at a heightened risk of falling prey to sexual temptations, thus their behavior is closely monitored and any indication of sexual activity triggers a punitive chain reaction that can result in their being preemptively removed from school.

Differences in partner characteristics may also explain these gender discrepant findings.
According to the survey data, female students more often date men who are currently out of school (37% of those with partners versus 12% for male students). About one in five sexual partners of female students are formally employed, compared with only about one percent of the partners of male students. Female in-school respondents also more frequently report having partners who live outside of Balaka district than do their male peers (24% versus 13% for men). Together, these statistics indicate that male students more frequently date women who are available during school hours, while female students tend to date men who are working or live far away, making daytime visits more difficult. As such, men may not only face a lower hazard of punishment for skipping school; they may also have more incentives to do so.

Like any analysis using self-reported survey and interview data, the potential effect of response bias should be considered when interpreting these findings (Poulin 2010). The TLT data found no cases of “virgin pregnancies,” in which a respondent tested positive on a pregnancy test while reporting that they had not had sex in the past five months. Female respondents are subject to greater stigma in reporting premarital sexual activity in general, and in school, girls are held to higher standards of sexual restraint. These gendered cultural pressures should result in female students being less likely to report that they are in a relationship while in school, and result in a greater amount of undetected heterogeneity in the category “not in a relationship” for female respondents relative to male respondents in the survey data (Kelly et al. 2013). These gender differences would bias the results towards null findings for female respondents compared to male respondents. Yet I find, conversely, a strong statistical relationship between sexual relationships and school leaving for women but no relationship for men. While I recognize that the likely presence of students’ sexual relationships that are not measured in my data, I think it unlikely that response bias explains the finding that female students are more likely to leave school when they have a sexual partner.

DISCUSSION AND CONCLUSION

Relationships do indeed disrupt schooling trajectories for women, but not because they negatively affect behavior or academic performance. Instead, students’ sexual relationships in Malawi are dissonant with a deeply salient cultural schema about what it means to be a student, particularly a female student. Individuals make sense of this schema through a stock of collective narratives that emphasize how relationships render women unfit for further schooling. Sexual relationships threaten the moral boundary between in-school and out-of-school youth. Teachers, parents, and students structure their behavior in accordance with these narratives, and it is the aggregation of these actions that sustain the antinomy of sex and schooling for youth in Balaka.
To understand how cultural meanings both diverge from and constitute aggregate behavioral patterns, I argue that it is important to distinguish between schemas and narratives. Cultural schemas are the abstract associations between concepts (Holland and Quinn 1997), and collective narratives are the more concrete accounts of the mechanisms that explain these associations (Ewick and Silbey 2003; White 2009). Collective narratives are what we use to grasp and justify cultural schemas. In this case explored in this article, the broader schemas oppose sex and schooling and portray women as being particularly vulnerable to the mal-effects of sexual temptation. People make sense of these schemas through a stock of collective narratives that offer accounts of how relationships render women unfit for further schooling.

The logic inherent in narrative accounts tends to emphasize moral closure—the characters get what they deserve (Ewick and Silbey 2003; White 2009). The mechanisms driving outcomes in collective narratives are often the moral characteristics of individuals, such as willpower, virtue, or conversely, “tragic faults” (Ricoeur 1990; Polletta et al. 2011 see also; Bruner 1991). In the case explored in this article, the collective narratives place the blame squarely on the students themselves, and their inability to resist temptation and remain focused on their educational ambitions. But Malawian teachers and parents can’t easily assess their students’ motivation, determination, or virtue; such attributes are internal to the individual. The actions that local Malawians believe to be visible manifestations of these internal moral attributes, such as classroom decorum, focus, and consistency of effort, are themselves highly subjective and slippery, particularly in the overstuffed and understaffed classrooms of rural Malawi. Teachers do not have access to aggregate data on their students—records are skeletal, typically not disseminated, and widely believed to be inaccurate even by the administrators tasked with collecting them. Rural Malawians, even more than their counterparts in the United States, thus lack, in Bourdieu’s words, the “freedom from necessity” (2000:117) to have access to the scientific knowledge about schooling trajectories presented in this paper, and rely instead on “the truth immediately given to lived consciousness” (2008:202).

More broadly, this focus on moral characteristics provides insight into why collective narratives are difficult to invalidate, even when they are inconsistent with the general patterns of outcomes for the population that the narrative is directed towards. Because they provide logically coherent accounts that emphasize the inherent moral qualities of specific individuals, collective narratives misdirect our attention from the ways that our actions, and the actions of those around us, actually help to sustain the broader schema underlying the narrative. This obfuscation is a key feature in why narratives constitute aggregate patterns of action.
The disciplinary actions of the teachers are punitive and unjust. But the stories provide a lens through which they can be viewed as not only fair but also banal, an obvious responsibility that comes with their job. Because the narratives equate sexual relationships with an unavoidable inability to perform the tasks expected of students, teachers should and in fact must punish students who engage in this unscholarly behavior. In such a meaning system, removing such students from school is not viewed as causing their departure from school, but rather as an appropriate response to the action that itself caused it.

In the US, as in Southern Malawi, schools are built around doling out consequences to students who breach the shared understanding of what it takes to be successful in school. In US schools, collective narratives of educational success typically rely more heavily on academic effort and intellectual discipline rather than moral comportment and bodily discipline. If a student in this context fails a class or continually fails to submit homework assignments in a US high school, her teacher would be expected to follow the policies set out to make the student perform better—parents may be notified, the student may have mandatory remedial classes, extracurricular opportunities may be taken away, and in severe cases, the student may not be allowed to progress to the next grade. Such actions are perceived as professional duties rather than interventions that shape a student’s academic trajectory.

Survey data represent accounts of actions and decisions carried out in relation to shared schemas and narratives, but these cultural elements are concealed in most statistical analyses, which assume independence between explanatory variables and fail to account for relationships between actors. Linked qualitative and quantitative data provide opportunities to examine the cultural meaning systems that undergird statistical patterns, and these data are increasingly available, even in poor and distant countries like Malawi (Schatz 2012). But the goal of understanding how shared schemas shape demographic trends points to some unique methodological concerns. Mixed-methods researchers often privilege “nesting” interview respondents within quantitative surveys in order to more deeply examine the motivations underlying observed behaviors (Small 2011:69; see also Bennett et al. 2009; England and Edin 2009; Vaisey and Lizaro 2009). However, the present study shows the advantages of interviewing people outside of the survey sample, particularly authority figures or others most likely to enable or constrain the actions of survey respondents. This article also shows that qualitative data can reveal not only how people interpret their circumstances and experiences using cultural schemas, but also the various ways that individuals perpetuate shared meanings through their actions, either by shaping their own life trajectories to conform to these models or by intervening in the lives of others to enforce them.
I have focused on the ways that individuals behave in accordance with the cultural schema opposing sex and schooling. But institutions also play a role in sustaining shared schemas, and may do so for different reasons than the individuals who populate them. For example, for schools in Malawi, this model may provide a moral explanation of why so many students fail to achieve their goals—they are not able to resist the temptations of sex—which may be more palatable than the structural reason—there simply aren’t enough resources to educate all capable children who begin school in Malawi (Kadzamira and Rose 2003). Such a moralization of educational failure has been documented for poor youth in the United States (MacLeod 2009; Young 2004). HIV/AIDS organizations may be motivated to perpetuate this schema because it neatly echoes their fundamental dictum: wait to have sex until you are older and married, or you will face severe consequences (Watkins and Swidler 2013).

These findings have important implications for those seeking to improve educational retention in Malawi. Policies aimed at reducing the extent to which sexual activity stalls educational trajectories have typically pursued strategies of prevention (i.e., educating youth about the risks and consequences of sex) or mitigation (i.e., allowing students to return to school after having given birth). Yet this study suggests that educational outcomes might be improved through policies geared towards reducing the stigma associated with being sexually active while in school. Adolescents in Malawi face myriad risks and pitfalls as they have sex and fall in love, but relationships are also an important developmental milestone, particularly in a context of early and nearly universal marriage. As more youth remain in school through early adulthood, abstaining until graduation becomes less feasible. If students were encouraged by adults to pursue healthy and mutually affirming relationships, rather than preemptively punished for any sign of romantic or sexual activity, this might help reduce the friction between having sex and staying in school.

Finally, this article helps elucidate why sexual relationships are associated with leaving school particularly for girls in the sub-Saharan African context (Biddlecom et al. 2008; Clark and Mathur 2012). Scholars have posited that pregnancy may be driving this gender discrepancy (Eloundou-Enyegue 2004; Meekers and Ahmed 1999), but evidence has been mixed regarding the role that pregnancies actually play in this process (Lloyd and Mensch 2008; Mensch et al. 2001). I find that even when pregnancy cases are removed, girls face a significantly higher likelihood of leaving school if they are in a relationship. I argue instead that the cultural schema opposing sex and schooling overlaps with schemas of gender and sexuality, making the boundary between sex and school more salient for female students and potentially exacerbating gendered inequalities in school attainment. The cultural schema opposing sex and schooling is a prism through which individual-level perceptions and choices are refracted. Statistical
patterns reflect the various ways that people behave in relation to shared narratives about the social world, even in cases where such patterns clash with the narratives themselves.
1 White (2008:187) uses the same metaphor to describe how “stories are ways to bridge between different scales.”

2 Researchers have also examined how educational experiences shape patterns of sexual behavior, demonstrating that in-school youth wait longer to become sexually active (e.g., Kaufman 2004; Lloyd 2005; McGrath et al. 2009) and are more likely to use condoms (Baker, Leon, and Collins 2010; Hargreaves et al. 2008). Recently, scholars have begun to look beyond enrollment status to examine how variation in educational experiences influences sexual behavior (Grant and Hallman 2008; Marteleto, Lam, and Ranchhod 2008).

3 Analyses not shown, but the Demographic and Health Survey (DHS) data are available to download free of cost at http://www.measuredhs.com. Estimates are weighted to be nationally representative.

4 The upward trend in at first sex has elsewhere been attributed to increasing secondary education, HIV prevention programs, and rural to urban migration (Tenkorang, Rajulton, and Maticka-Tyndale 2009; Zaba 2004).

5 TL T is designed by Jenny Trinitapoli and Sara Yeatman and funded by a grant (R01- HD058366) from the National Institute of Child Health and Human Development. For more information, visit https://projects.pop.psu.edu/tlt.

6 In so doing, I am selecting on those who remained in school past age 15. While these findings should not be generalized to the entire population of Balaka, this narrow focus is substantively appropriate for the research questions examined here. Youth who remain in school through their later teens are a growing proportion of the population in Malawi, and it is this group for whom the antinomy between sex and schooling poses the greatest challenges.

7 Fixed-effects models are presented here in preference to random-effects models because the random effects models did not pass the Hausman test of the independence of unobserved individual-specific effects.

8 While leaving, going back to school, and then leaving again is possible, this pattern was not observed in these data.

9 The propensity-score weighting removes all statistically significant differences between the treatment and control groups in terms of all covariates (tables available upon request).

10 Following advice from Morgan and Harding (2006), I tried several other matching techniques, including nearest neighbor (n=5), radius (r=0.05), and kernel (Gaussian and Epanechnikov). The results did not change substantively depending on matching algorithm used.

11 For more details regarding the wording of any question used in the survey, please contact the author or refer to the TLT project website (https://projects.pop.psu.edu/tlt).
This measure is preceded by a question about whether the respondent had trouble paying school fees, so it is unlikely that it captures financial difficulties related to school attendance. Conversations with interviewers and field staff suggest that respondents generally interpreted this question as being about academic problems, though the prompt is open-ended and could refer to a variety of school-related problems, including disciplinary issues and fights with students.

For each wave, an index was constructed using principal components analysis of a list of 20 household goods, personal possessions, and housing attributes.

The Malawian education system consists of 8 years of primary school (Standard 1-8) and 4 years of secondary school (Form 1-4).

Because test scores were measured only once during the survey period for each respondent, I could not include them in the fixed-effects models. However, the lack of association between relationship status and test scores leaves me confident that this measure does not mediate the association between sexual relationships and school leaving.

To investigate whether this high proportion is due to the fact that respondents who are still in school at the start of the survey (and thus are in the analytic subsample used for this study) remain in school later into their adolescence, I also examined the reasons given for leaving school for respondents who left school prior to the start of the survey. While a considerably smaller percentage of these respondents attribute leaving school to pregnancy and marriage, these events together account for over a quarter of these earlier schooling exits, adding further evidence that pregnancy does indeed seem to derail school plans for a significant proportion of young women in Balaka.

Because marriage was also a frequently cited reason for leaving school in the survey data (see Table 5), I estimated the same model excluding women who attribute leaving school to marriage or who reported getting married within one survey wave of reporting leaving school. The results were substantially equivalent (results available upon request).

Similarly, Chikondi, who is 17 and in Form 3, describes how she communicated her expectations at the start of her relationship: “I told him that there are different types of relationships, the relationship I can manage is of sharing ideas, but I cannot manage the other relationship, the one like marriage, that will confuse me.” In Kisumu, Kenya, students make a similar distinction between “relationships for school” and “relationships for love” (Mojola 2008).

In terms of response bias related to the three mechanisms (pregnancy, test scores, and absence from school), because reports of pregnancy are validated using pregnancy tests, I am quite confident in the validity of these results. A story through which underreporting would explain the null results of absenteeism and test scores would require that female students who report being in a sexual relationship were less likely to report these outcomes than their peers who are not in a relationship. Given that these school absence and low test scores are also likely to be the subject of stigma, albeit less so than reporting sexual activity while in school. It would thus be surprising if the respondents who disclose that they are in a sexual relationship would be less likely to admit to being absent or scoring poorly on a test.
REFERENCES


Long, Scott J., and Jeremy Freese. 2006. “Regression Models for Categorical Dependent Variables Using Stata.” *College Station, Tex.: StataCorp LP.*


Shore, Bradd. 1998. *Culture in Mind*. Oxford University Press US.


FIGURES AND TABLES

Figure 1: Overview of Cultural Schemas and Collective Narratives

Cultural Schemas:
- Antinomy of sex and schooling
- Girls’ vulnerability to sexual temptation

Collective Narratives:
- Desire to spend time with partner
- Absence from class
- Distraction during class and study
- Poor performance, failed exams
- Pregnancy
- Forced removal from school
- Dropout
<table>
<thead>
<tr>
<th>Sexual Relationship Status</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single</td>
<td>In a Relationship</td>
</tr>
<tr>
<td><strong>Leaving School</strong>&lt;sup&gt;a&lt;/sup&gt; (% Person-waves at risk)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6%***</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>6%†</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td><strong>Absent from School</strong>&lt;sup&gt;b&lt;/sup&gt; (% Person-waves)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30%†</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>30%***</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td><strong>Mean Test Score</strong> (s.d.)&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>54.19 (15.30)</td>
<td>52.17 (16.27)</td>
</tr>
<tr>
<td>Math</td>
<td>48.53 (17.46)</td>
<td>44.18 (16.69)</td>
</tr>
<tr>
<td><strong>Trouble in School</strong>&lt;sup&gt;a&lt;/sup&gt; (% Person-waves)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td><strong>N</strong> (at wave 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>421</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td>221</td>
<td>94</td>
<td></td>
</tr>
</tbody>
</table>

Note: †=0.10, *=0.05, **=0.01, ***=0.001; stars indicate significant results using a one-tailed t-test comparing single respondents and those in a relationship.

<sup>a</sup> Relationship status is lagged one wave.

<sup>b</sup> Because the absence measure specifically refers to the week immediately preceding the survey interview, relationship status is measured at the same wave as absence (not lagged).
Table 2: Schooling and Relationship Transitions, Waves 1-6

<table>
<thead>
<tr>
<th>Origin State (Wave 1)</th>
<th>Destination State</th>
<th>Wave 2</th>
<th>Wave 4</th>
<th>Wave 6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEMALE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school, Single</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=421</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school, single</td>
<td>91%</td>
<td>81%</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>In school, in relationship</td>
<td>7%</td>
<td>6%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Out of school, single</td>
<td>1%</td>
<td>5%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Out of school, in relationship</td>
<td>1%</td>
<td>8%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Attrition</td>
<td>17</td>
<td>32</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>In school, In Relationship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=107</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school, single</td>
<td>54%</td>
<td>33%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>In school, in relationship</td>
<td>37%</td>
<td>23%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Out of school, single</td>
<td>3%</td>
<td>9%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Out of school, in relationship</td>
<td>6%</td>
<td>35%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Attrition</td>
<td>9</td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>MALE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school, Single</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=221</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school, single</td>
<td>89%</td>
<td>74%</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>In school, in relationship</td>
<td>8%</td>
<td>8%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Out of school, single</td>
<td>3%</td>
<td>16%</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>Out of school, in relationship</td>
<td>0%</td>
<td>3%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Attrition</td>
<td>4</td>
<td>17</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>In school, In Relationship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In school, single</td>
<td>52%</td>
<td>58%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>In school, in relationship</td>
<td>42%</td>
<td>23%</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>Out of school, single</td>
<td>3%</td>
<td>8%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Out of school, in relationship</td>
<td>3%</td>
<td>10%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Attrition</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Respondents who previously attrited from the sample are not included in the proportions for each wave.
Table 3: Case-Time-Control and Doubly-Robust Propensity Score Models Predicting Leaving School

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case-Time Control Models</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR/(se)</td>
<td>OR/(se)</td>
</tr>
<tr>
<td>(Fixed-Effects for Nonrepeatable Events)</td>
<td>(1)</td>
<td>(3)</td>
</tr>
<tr>
<td>Respondent was in a sexual relationship</td>
<td>2.98 (0.87)**</td>
<td>1.28 (0.57)</td>
</tr>
<tr>
<td>Observations (Respondents)</td>
<td>715 (145)</td>
<td>609 (112)</td>
</tr>
</tbody>
</table>

**Doubly-Robust Propensity Score Models**

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted probability of leaving school if no respondents were in a relationship at wave 1</td>
<td>0.29</td>
<td>0.21</td>
</tr>
<tr>
<td>Predicted probability of leaving school if all respondents were in a relationship at wave 1</td>
<td>0.46</td>
<td>0.24</td>
</tr>
<tr>
<td>Difference in predicted probabilities</td>
<td>0.17 (0.06)**</td>
<td>0.03 (0.06)</td>
</tr>
<tr>
<td>(estimate of effect size of sexual relationship status on leaving school)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>411</td>
<td>264</td>
</tr>
</tbody>
</table>

Notes: †=0.10, *=0.05, **=0.01, ***=0.001.

a The case-time-control models include the following time-variant covariates (described in Appendix 1, Table A5): socio-economic status, current year in school, difficulty paying school fees, declining health, educational expectations, employment status, and dummy variables indicating survey wave. All independent variables are lagged by one survey wave.

b The doubly-robust models account for the following covariates (described in Appendix Table A5): age, socioeconomic status, current level of school, and attitudes and expectations related to education. These covariates were all used to estimate both the propensity scores and the outcome model, and were measured at wave one.
Table 4: Exploring Whether Each Mechanism Mediates the Relationship Between Relationship Status and Leaving School for Female Respondents

<table>
<thead>
<tr>
<th>Case-Time Control Models(^a) (Fixed-Effects for Nonrepeatable Events)</th>
<th>Absence OR/(se) (1)</th>
<th>School Performance OR/(se) (2)</th>
<th>Female Non-Pregnant Subsample OR/(se) (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent was in a sexual relationship</td>
<td>2.98 (0.87)**(^a)</td>
<td>2.96 (0.86)**(^a)</td>
<td>2.31 (0.90)*(^a)</td>
</tr>
<tr>
<td>Observations (Respondents)</td>
<td>715 (145)</td>
<td>715 (145)</td>
<td>556 (103)</td>
</tr>
</tbody>
</table>

Doubly-Robust Propensity Score Models\(^b\)

| | Predicted probability of leaving school if no respondents were in a relationship at wave 1 | 0.21 |
| | Predicted probability of leaving school if all respondents were in a relationship at wave 1 | 0.36 |
| | Difference in predicted probabilities (estimate of effect size of sexual relationship status on leaving school) | 0.15 (0.06)* |
| | N | 359 |

Notes: \(^{†}=0.10, *=0.05, **=0.01, ***=0.001.\)
Table 5: Reasons Given for Leaving School During Waves 2-6

<table>
<thead>
<tr>
<th>Reason for Leaving School</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of interest in school</td>
<td>6%</td>
<td>30%</td>
<td>15%</td>
<td>12%</td>
</tr>
<tr>
<td>Financial constraints/lack of supplies</td>
<td>47%</td>
<td>60%</td>
<td>49%</td>
<td>75%</td>
</tr>
<tr>
<td>Illness of Respondent/family member</td>
<td>5%</td>
<td>2%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>29%</td>
<td>0%</td>
<td>21%</td>
<td>0</td>
</tr>
<tr>
<td>Marriage</td>
<td>7%</td>
<td>2%</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
<td>6%</td>
<td>2.5%</td>
<td>8%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

\(N\)  

155  

99  

845  

207
Appendix 1: Supplementary Figures and Tables

Table A1: Timing of TLT Survey Waves and Sample Attrition

<table>
<thead>
<tr>
<th>Wave</th>
<th>Time Period</th>
<th>Total Random Sample</th>
<th>Subsample: In School at Wave 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N (% of W1 Sample)</td>
<td>N (% of W1 Subsample)</td>
</tr>
<tr>
<td>1</td>
<td>June to August, 2009</td>
<td>2,045 (100%)</td>
<td>843 (100%)</td>
</tr>
<tr>
<td>2</td>
<td>October to December, 2009</td>
<td>1,952 (95%)</td>
<td>814 (97%)</td>
</tr>
<tr>
<td>3</td>
<td>February to April, 2010</td>
<td>1,895 (93%)</td>
<td>777 (92%)</td>
</tr>
<tr>
<td>4</td>
<td>June to August, 2010</td>
<td>1,855 (91%)</td>
<td>757 (90%)</td>
</tr>
<tr>
<td>5</td>
<td>October to December, 2010</td>
<td>1,752 (86%)</td>
<td>709 (84%)</td>
</tr>
<tr>
<td>6</td>
<td>February to April, 2011</td>
<td>1,708 (84%)</td>
<td>686 (81%)</td>
</tr>
</tbody>
</table>

The case-time-control models include the following time-variant covariates (described in Appendix 1, Table A5): socio-economic status, current year in school, difficulty paying school fees, declining health, educational expectations, employment status, and dummy variables indicating survey wave. All independent variables are lagged by one survey wave.

The doubly-robust models account for the following covariates (described in Appendix Table A5): age, socioeconomic status, current level of school, and attitudes and expectations related to education. These covariates were all used to estimate both the propensity scores and the outcome model, and were measured at wave one.
Table A2: Comparison of the Analytic Subsamples Used to Examine Each Schooling Outcome

<table>
<thead>
<tr>
<th>Outcome of Interest</th>
<th>School Leaving</th>
<th>School Absence</th>
<th>School Performance</th>
<th>School Leaving</th>
<th>School Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable Measure</strong></td>
<td>Leaving School over time, waves 2-6</td>
<td>Absence</td>
<td>Trouble in School</td>
<td>Leaving School between wave 1 and wave 6</td>
<td>Test Scores</td>
</tr>
<tr>
<td><strong>Table with Results</strong></td>
<td>Table 3</td>
<td>Table A3</td>
<td>Table A5</td>
<td>Table 3</td>
<td>Table A4</td>
</tr>
<tr>
<td><strong>Statistical Model</strong></td>
<td>Fixed Effects Time Series Logistic Regression</td>
<td>Logistic regression with doubly-robust propensity scores</td>
<td>OLS regression with and without doubly-robust propensity scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sample Exclusions</strong></td>
<td>• Respondents who were out of school at start of survey</td>
<td>• 120 respondents who were lost to follow-up or had migrated between wave 1 and wave 6</td>
<td>• 86 respondents who were lost to follow-up or had migrated by wave 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Descriptive Statistics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>843</td>
<td></td>
<td>631</td>
<td>573</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37%</td>
<td></td>
<td>39%</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>Average Age (s.d.)</td>
<td>16.7 (1.7)</td>
<td>16.4 (1.6)</td>
<td>16.4 (1.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average SES Score (s.d.)</td>
<td>0.57 (2.64)</td>
<td>0.07 (2.31)</td>
<td>0.43 (2.56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education at Wave 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Primary</td>
<td>13%</td>
<td></td>
<td>15%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Upper Primary</td>
<td>43%</td>
<td></td>
<td>50%</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>Lower Secondary</td>
<td>26%</td>
<td></td>
<td>28%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Upper Secondary</td>
<td>18%</td>
<td></td>
<td>7%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>In a relationship, wave 1</td>
<td>30%</td>
<td></td>
<td>23%</td>
<td>20%</td>
<td></td>
</tr>
</tbody>
</table>
Table A3: Fixed Effects Time Series Logistic Regression Models Predicting School Absence, Waves 2-6

<table>
<thead>
<tr>
<th></th>
<th>School absence during week preceding interview&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female OR/(se)</td>
<td>Male OR/(se)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>Respondent was in a sexual relationship</td>
<td>0.97 (0.19)</td>
<td>1.51 (0.30)*</td>
<td></td>
</tr>
<tr>
<td>Socio-economic Status</td>
<td>1.03 (0.06)</td>
<td>1.17 (0.10)&lt;sup&gt;†&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Current Year in School</td>
<td>1.02 (0.08)</td>
<td>1.06 (0.11)</td>
<td></td>
</tr>
<tr>
<td>Trouble paying school fees over past 4 months</td>
<td>1.28 (0.22)</td>
<td>1.44 (0.30)&lt;sup&gt;†&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Decline in health over past 4 months</td>
<td>1.07 (0.33)</td>
<td>1.75 (0.85)</td>
<td></td>
</tr>
<tr>
<td>Probabilistic estimate of being in school in 1 year</td>
<td>0.98 (0.02)</td>
<td>1.04 (0.04)</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>2.24 (1.19)</td>
<td>1.11 (0.76)</td>
<td></td>
</tr>
<tr>
<td>Observations (Respondents)</td>
<td>1663 (345)</td>
<td>1138 (225)</td>
<td></td>
</tr>
</tbody>
</table>

Notes: †=0.10, *=0.05, **=0.01, ***=0.001.

<sup>a</sup> Because the absence measure specifically refers to the week immediately preceding the survey interview, all independent variables were recorded during the same wave as the outcome (not lagged).
Table A4: OLS and Doubly-Robust Propensity Score Models Predicting Examination Scores (Percents)

<table>
<thead>
<tr>
<th>OLS Regression Models</th>
<th>Female</th>
<th>Math</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English Coeff./se (1)</td>
<td>Math Coeff./se (1)</td>
<td>English Coeff./se (3)</td>
</tr>
<tr>
<td>In a Sexual Relationship</td>
<td>-3.00 (2.97)</td>
<td>-2.42 (3.08)</td>
<td>0.17 (3.20)</td>
</tr>
<tr>
<td>Background Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-1.17 (0.70)</td>
<td>-1.11 (0.73)</td>
<td>-1.16 (0.70)†</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>0.59 (0.36)</td>
<td>-0.03 (0.36)</td>
<td>-0.47 (0.50)</td>
</tr>
<tr>
<td>Level of School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Primary (Standard 2-5)</td>
<td>-4.75 (3.52)</td>
<td>5.30 (0.36)</td>
<td>-5.13 (4.18)</td>
</tr>
<tr>
<td>Upper Primary (Standard 6-8)</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Lower Secondary (Form 1-2)</td>
<td>-3.94 (2.17)†</td>
<td>-7.71 (2.26)**</td>
<td>-2.45 (2.63)</td>
</tr>
<tr>
<td>Upper Secondary (Form 3)</td>
<td>3.10 (2.85)</td>
<td>-12.47 (2.90)**</td>
<td>5.13 (3.33)</td>
</tr>
<tr>
<td>Attitudes and Expectations Related to Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondent would feel “very unsatisfied” if he/she left school</td>
<td>10.36 (3.28)</td>
<td>12.32 (9.06)</td>
<td>20.09 (15.04)</td>
</tr>
<tr>
<td>Probabilistic estimate of being in school in 1 year</td>
<td>0.28 (0.30)</td>
<td>-0.03 (0.32)</td>
<td>0.11 (0.48)</td>
</tr>
<tr>
<td>Plans to attend college</td>
<td>0.96 (1.99)</td>
<td>2.22 (2.10)</td>
<td>1.49 (1.51)</td>
</tr>
<tr>
<td>R²</td>
<td>0.07</td>
<td>0.13</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Doubly Robust Propensity Score Models

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Math</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average predicted value if no respondents were in a relationship at wave 3</td>
<td>54.67</td>
<td>48.31</td>
<td>54.89</td>
</tr>
<tr>
<td>Average predicted value if all respondents were in a relationship at wave 3</td>
<td>50.55</td>
<td>47.06</td>
<td>51.90</td>
</tr>
<tr>
<td>Difference in predicted values (estimate of effect size of sexual relationship status on tests scores)</td>
<td>-4.11 (2.68)</td>
<td>-1.25 (2.83)</td>
<td>-2.99 (2.90)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>Female</th>
<th>Math</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>347</td>
<td>347</td>
<td>214</td>
</tr>
</tbody>
</table>

Notes: †=0.10, *=0.05, **=0.01, ***=0.001.

a The doubly-robust models account for the same list of cofounders as the OLS model results (described in Appendix 1, Table A5). All covariates were observed at wave 3 (one wave before test scores were recorded).
Table A5: Fixed Effects Time Series Logistic Regression Models Predicting Having Trouble in School, Waves 2-6

<table>
<thead>
<tr>
<th></th>
<th>Female OR/(se)</th>
<th>Male OR/(se)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Respondent was in a sexual</td>
<td>0.87 (0.25)</td>
<td>1.16 (0.32)</td>
</tr>
<tr>
<td>relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socio-economic Status</td>
<td>0.99 (0.08)</td>
<td>1.33 (0.16)*</td>
</tr>
<tr>
<td>Current Year in School</td>
<td>1.39 (0.16)**</td>
<td>1.39 (0.18)*</td>
</tr>
<tr>
<td>Trouble paying school fees over</td>
<td>1.11 (0.17)</td>
<td>1.23 (0.21)</td>
</tr>
<tr>
<td>past 4 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decline in health over past 4</td>
<td>1.07 (0.43)</td>
<td>1.37 (0.22)†</td>
</tr>
<tr>
<td>months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probabilistic estimate of being</td>
<td>0.99 (0.03)</td>
<td>1.03 (0.05)</td>
</tr>
<tr>
<td>in school in 1 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>2.77 (2.70)</td>
<td>0.30 (0.37)</td>
</tr>
<tr>
<td>Observations (Respondents)</td>
<td>899 (208)</td>
<td>635 (145)</td>
</tr>
</tbody>
</table>

Notes: †=0.10, *=0.05, **=0.01, ***=0.001.

a All independent variables are lagged by one survey wave, so that variables measured at each point in time predict having trouble in school over the next four months.
Appendix 2: Regression Model Equations

Fixed-Effects Models

First, I define the following terms:

- \( \pi_{it} \) = Probability that individual \( i \) experiences the outcome at time \( t \).
- \( X_{it} \) = A vector of observed individual characteristics that vary over time.
- \( z_i \) = A vector of variables that vary over individuals but are constant over time.
- \( \alpha_i \) = Unobserved individual characteristics that are constant over time.
- \( \mu_{it} \) = Error term.

The fixed-effects model is defined as:

\[
\ln \left( \frac{\pi_{it}}{1 - \pi_{it}} \right) = \beta X_{it} + \gamma z_i + \alpha_i + \mu_{it}
\]

Because the fixed-effects model predicts changes in the outcome variable based on changes in predictor variables, all time-invariant terms in the model, including \( z_i \) and \( \alpha_i \), will drop out. Thus, fixed-effects models control for all observed and unobserved individual-level variation that is fixed over time.

For cases with more than two observations per individual, fixed-effects logistic regression models are estimated using conditional maximum likelihood estimation (Allison 2009; Treiman 2009). These models are estimated in this article using the \texttt{xtlogit, fe} command in Stata 1.
Doubly-Robust Propensity Score Models

First, I denote an individual, \( i \), from a sample of size \( N \) to have received a binary exposure, \( A_i \) [\( i = 1 \) for treatment (respondent reported having a current sexual partner at wave 1), \( i = 0 \) for control (respondent did not report a sexual partner at wave 1)]. Let \( Y_{i,1} \) and \( Y_{i,0} \) be the counterfactual posttest outcomes (whether or not the respondent has left school by wave 6) under treatment and control, respectively. Which outcome is observed (\( Y_{i,1} \) versus \( Y_{i,0} \)) depends on the treatment variable \( A_i \).

is a vector of all baseline variables. I am interested in estimating \( \Delta \), or the average change in outcome given the treatment, which is estimated as the difference in expected value of the outcome for those receiving the treatment compared to those receiving the control, or \( E(Y_{i,1}|X_i) - E(Y_{i,0}|X_i) \).

The propensity score component of the model is defined as the probability of experiencing the treatment given the subject’s observed characteristics \( X_i \), or \( \pi_i = \Pr(A_i = 1|X_i) \). The doubly-robust method uses the inverse probability of treatment weight (IPTW) method, in which propensity scores \( \hat{p}_i \), which are the predicted values from a logistic regression model predicting \( A_i \) based on \( X_i \), are used to specify inverse probability of treatment weights (IPTWs). The inverse weights are equal to \( 1/\hat{p}_i \) if \( A_i = 1 \) and \( 1/(1-\hat{p}_i) \) if \( A_i = 0 \).

The IPTW propensity score estimation of \( \Delta \) is:

\[
\hat{\Delta}_{IPTW} = \frac{1}{N} \sum_{i=1}^{N} \left( \frac{A_i Y_i}{\hat{p}_i} \right) - \frac{1}{N} \sum_{i=1}^{N} \left( \frac{(1-A_i)Y_i}{1-\hat{p}_i} \right).
\]

The doubly-robust model also incorporates a term specifying the predicted values from regressions of the outcome on the baseline covariates, in this article either logistic regression predicting leaving school between wave 2 and wave 6 or ordinary least squares regression predicting test scores at wave 4 based on \( X_i \), where the regressions are carried out separately for each treatment group (\( A_i = 1 \) versus \( A_i = 0 \)). This term is defined as \( m_A(X_i) = E(Y_i|A_i = A, X_i) \) for \( A = 0 \) or \( A = 1 \).

The doubly-robust estimator of \( \Delta \), as defined by Lunceford and Davidian (2004) and designed for Stata by Emsley et al (2008) is:

\[
\hat{\Delta}_{DR} = \frac{1}{N} \sum_{i=1}^{N} \left( \frac{A_i Y_i - (A_i - \hat{p}_i)m_1(X_i)}{\hat{p}_i} \right) - \frac{1}{N} \sum_{i=1}^{N} \left( \frac{(1-A_i)Y_i + (A_i - \hat{p}_i)m_0(X_i)}{1-\hat{p}_i} \right).
\]

These models were estimated using the dr command in Stata10.