THE POWER OF TV: CABLE TELEVISION AND WOMEN'S STATUS IN INDIA*

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Cable and satellite television have spread rapidly throughout the developing world. These media sources expose viewers to new information about the outside world and other ways of life, which may affect attitudes and behaviors. This paper explores the effect of the introduction of cable television on women's status in rural India. Using a three-year, individual-level panel data set, we find that the introduction of cable television is associated with significant decreases in the reported acceptability of domestic violence toward women and son preference, as well as increases in women's autonomy and decreases in fertility. We also find suggestive evidence that exposure to cable increases school enrollment for younger children, perhaps through increased participation of women in household decision making. We argue that the results are not driven by preexisting differential trends.

I. INTRODUCTION

The growth of television in the developing world over the past two decades has been extraordinary. Estimates suggest that the number of television sets in Asia has increased more than sixfold, from 100 million to 650 million, since the 1980s (Thomas 2003). In China, television exposure grew from 18 million people in 1977 to 1 billion by 1995 (Thomas 2003). In more recent years, satellite and cable television availability has increased dramatically. Again in China, the number of people with satellite access increased from just 270,000 in 1991 to 14 million by 2005. Further, these numbers are likely to understate the change in the number of people for whom television is available, because a single television is often watched by many.

Several studies have demonstrated that the information and exposure provided by television can influence a wide range of attitudes and behavior. Gentzkow and Shapiro (2004) find that television viewership in the Muslim world affects attitudes toward the West, and DellaVigna and Kaplan (2007) show large effects of the Fox News Channel on voting patterns in the United States. In the developing world, Olken (2006) shows that television decreases participation in social organizations in Indonesia, and Chong, Duryea, and La Ferrara (2007) find that exposure to soap operas in Brazil reduces fertility.

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India has not been left out of the cable and satellite revolution: a recent survey finds that 112 million households in India own a television, with 61% of those homes having cable or satellite service (National Readership Studies Council 2006). This figure represents a doubling in cable access in just five years from a previous survey. The survey finds that in some states, the change has been even more dramatic; in the span of just ten to fifteen years since it first became available, cable or satellite penetration has reached an astonishing 60% in states such as Tamil Nadu, even though the average income is below the World Bank poverty line of two dollars per person per day.

Beyond providing entertainment, television vastly increases both the availability of information about the outside world and exposure to other ways of life. This is especially true for remote, rural villages, where several ethnographic and anthropological studies have suggested that television is the primary channel through which households get information about life outside their village (Mankekar 1993, 1998; Fernandes 2000; Johnson 2001; Scrase 2002). Most popular cable programming features urban settings where lifestyles differ in prominent and salient ways from those in rural areas. For example, many characters on popular soap operas have more education, marry later, and have smaller families, all things rarely found in rural areas; and many female characters work outside the home, sometimes as professionals, running businesses or in other positions of authority. Anthropological accounts suggest that the growth of TV in rural areas has had large effects on a wide range of day-to-day lifestyle behaviors, including latrine building and fan usage (Johnson 2001). Yet there have been few rigorous empirical studies of the impacts that this dramatic expansion in cable access may have had on social and demographic outcomes.

In this paper we explore the effect of the introduction of cable television in rural areas of India on a particular set of values and behaviors, namely attitudes toward and discrimination against women. Although issues of gender equality are important throughout the world, they are particularly salient in India. Sen (1992) argued that there were 41 million "missing women" in India—women and girls who died prematurely due to mistreatment—resulting in a dramatically male-biased population. The population bias toward men has only gotten worse in the past two decades, as sex-selective abortion has become more widely used to avoid female births (Jha et al. 2006). More broadly,

girls in India are discriminated against in nutrition, medical care, vaccination, and education (Basu 1989; Griffiths, Matthews, and Hinde 2002; Pande 2003; Borooah 2004; Mishra, Roy, and Retherford 2004; Oster 2009). Even within India, gender inequality is significantly worse in rural than urban areas. By exposing rural households to urban attitudes and values, cable and satellite television may lead to improvements in status for rural women. It is this possibility that we explore in this paper.

The primary analysis relies on a three-year panel data set covering women in five Indian states between 2001 and 2003. These years represent a time of rapid growth in rural cable access. During the panel, cable television was newly introduced in 21 of the 180 sample villages.[1] Our empirical strategy relies on comparing changes in gender attitudes and behaviors between survey rounds across villages based on whether (and when) they added cable television.

Using these data, we find that cable television has large effects on women's status. After cable is introduced to a village, there are significant changes in gender attitudes: women are less likely to report that it is acceptable for a husband to beat his wife, and less likely to express a preference for sons. Behaviors traditionally associated with women's status also change: women report increased autonomy (e.g., the ability to go out without permission and to participate in household decision making) and lower fertility. In terms of magnitude, the effects are quite large—for example, the introduction of cable decreases the differences in attitudes and behaviors between urban and rural areas by 45% to 70%. Further, these effects happen quickly, with observable impacts in the first year following cable introduction. This is consistent with existing work on the effects of media exposure, which typically find rapid changes (within a few months, in many cases) in behaviors such as contraceptive use, pregnancy, latrine building, and perception of own-village status (Pace 1993; Valente et al. 1994; Kane et al. 1998; Rogers et al. 1999; Johnson 2001).

A central empirical concern is the possibility that trends in other variables (e.g., income or "modernity") affect both cable

1. Cable television in these villages is generally introduced by an entrepreneur, who purchases a satellite dish and subscription and then charges people (generally within 1 km of the dish) to run cables to it. In this sense, people are actually accessing satellite channels. We will use the terms cable and satellite interchangeably to refer to programming not available via public broadcast signals. Our interest is with the content of programming available to households, rather than the physical means of delivery of that content.

access and women's status. We argue that this does not appear to be the case, first showing visually that there are no preexisting differential trends in women's status for villages that do and do not add cable, and that the timing of changes in outcomes is closely aligned with the introduction of cable; and second, that the outcomes are not correlated with future cable access.

Policy makers and academics often argue that a significant benefit of improved status for women is increased investments in children (World Bank 2001, 2006; Qian 2008). Although our ability to look at children's outcomes is limited, we are able to look at the effects of cable access on school enrollment. Using both our household panel data and administrative data for roughly 1,000 villages in the state of Tamil Nadu, we provide evidence that the introduction of cable increases school enrollment for younger children. Although the enrollment data have some limitations relative to the data on women's status, we see large effects of cable that also appear to increase over time. Again, we argue these results are not driven by preexisting trends in the outcome variables.

The results are potentially quite important for policy. As noted, a large literature in economics, sociology, and anthropology has explored the underlying causes of discrimination against women in India, highlighting the dowry system, low levels of female education, and other socioeconomic factors as central factors (Rosenzweig and Shultz 1982; Murthi, Guio, and Dreze 1995; Agnihotri 2000; Agnihotri, Palmer-Jones, and Parikh 2002; Rahman and Rao 2004; Qian 2008). And although progress has been made in these areas, changing the underlying factors behind low levels of education, women's status, and high fertility has proven to be very difficult; introducing television, or reducing any barriers to its spread, may be less so. In fact, the government of Tamil Nadu has recently begun a program to provide free color televisions to 7.5 million households with the goal of ensuring that every household has one by 2011. One of the primary objectives of this program is to enable women, particularly in rural areas, to "acquire knowledge for social and economic development." Therefore, our results also provide insight into the potential impact that this unique and nontraditional strategy can have on critical policy priorities.

From a policy perspective, however, there are potential concerns about whether the changes in reported attitudes, such as toward domestic violence or son preference, represent changes in *behaviors*, or just in reporting. For example, we may be concerned

that exposure to television only changes what the respondent thinks the interviewer wants to hear about the acceptability of beating, but does not actually change the incidence of beating. This is less of a concern in the case of autonomy and fertility, where women are asked about their actual behavior (and for fertility, there is less scope for misreporting because both pregnancies and recent births are likely to be observable by the interviewer). In addition, the fact that we find effects on education in administrative data provides support for an effect of cable on behavior. Without directly observing people in their homes, however, it is difficult to conclusively separate changes in reporting from changes in behavior. However, even if cable only changes what is reported, it still may represent progress: changing the perceived "correct" attitude seems like a necessary, if not sufficient, step toward changing outcomes.

The remainder of the paper is organized as follows. Section II provides background on television in India and discusses existing anthropological and ethnographic evidence on the impact of television on Indian society, as well as the determinants of cable placement. Section III describes the SARI data and empirical strategy. Section IV presents the results on women's status, and Section V the results on education. Section VI provides some discussion of magnitudes and timing of, and mechanisms behind, the results and concludes.

II. Television in India

II.A. Background

Although television was first introduced to India in 1959, for the first three decades almost all broadcasting was in the hands of the state, and the content was primarily focused toward news or information about economic development.[2] The most significant innovation in terms of both content and viewership was the introduction of satellite television in the early 1990s. In the five years from 2001 to 2006, about 30 million households, representing approximately 150 million individuals, added cable service (National Readership Studies Council 2006). And because television is often watched with family and friends by those without a television

2. The background information detailed here is drawn largely from Mankekar (1999) and http://www.indiantelevision.com/indianbrodcast/history/historyoftele.htm.

or cable, the growth in actual access or exposure to cable is likely to have been even more dramatic.

The program offerings on cable television are quite different from government programming. The most popular shows tend to be game shows and soap operas. For example, among the most popular shows in both 2000 and 2007 (based on Indian Nielsen ratings) is *Kyunki Saas Bhi Kabhi Bahu Thi* (*Because a Mother-in-Law Was Once a Daughter-in-Law, Also*), a show based around the life of a wealthy industrial family in the large city of Mumbai. As can be seen from the title, the main themes and plots of the show revolve around issues of family and gender.

The introduction of television appears in general to have had large effects on Indian society. This is particularly the case for gender, because this is an area where the lives of rural viewers differ greatly from those depicted on most popular shows. Because the most popular Indian serials take place in urban settings, women depicted on these shows are typically much more emancipated than rural women. Further, in many cases there is access to Western television, where these behaviors differ even more markedly from rural India. Based on anthropological reports, this seems to have affected attitudes within India. Scrase (2002) reports that several of his respondents thought television might lead women to question their social position and might help the cause of female advancement. Another woman reports that because of television, men and women are able to "open up a lot more" (Scrase 2002). Johnson (2001) quotes a number of respondents describing changes in gender roles as a result of television. One man notes, "Since TV has come to our village, women are doing less work than before. They only want to watch TV. So we [men] have to do more work. Many times I help my wife clean the house."

There is also a broader literature on the effects of television exposure on social and demographic outcomes in other countries. Many studies find effects on a variety of outcomes: for example, eating disorders in Fiji (Becker 2004), sex role stereotypes in Minnesota (Morgan and Rothschild 1983), and perceptions of women's rights in Chicago (Holbert, Shah, and Kwak 2003). Telenovelas in Brazil have provided a fruitful context for studying the effects of television. For example, on the basis of ethnographic research, La Pastina (2004) argues that exposure to telenovelas provides women (in particular) with alternative models of what role they might play in society. Pace (1993) describes the effect of television introduction in Brazil on a small, isolated, Amazon community,

arguing that the introduction of television changed the framework of social interactions, increased general world knowledge, and changed people's perceptions about the status of their village in the wider world. Kottak (1990) reports on similar data from isolated areas in Brazil and argues that the introduction of television affects (among other things) views on gender, moving individuals in these areas toward having more liberal views on the role of women in both the workplace and relationships. And closely related to one of our outcomes, Chong, Duryea, and La Ferrara (2007) report declines in fertility in Brazil in response to access to telenovelas; they also find changes in naming patterns of children, with the names of main characters featured on these programs increasing in popularity.

Interestingly, the ethnographic and anthropological studies in Brazil also suggest that the patterns of viewing shortly after television is first introduced may be quite different from what is seen later on. The evidence suggests that in the first years after introduction, interactions with the television are more intense, with the television drawing more focus (both at an individual level and community-wide). It is during this early period, as argued by Kottak (1990) and others, that television is at its most influential. Most of the villages in our analysis are at this early stage of television exposure, suggesting this may be an ideal period to look for effects.

Except for Chong, Duryea, and La Ferrara (2007), much of the evidence described above is drawn from interviews and case studies, and obviously does not reflect a random sample of these populations. Nevertheless, the overall impression given by the anthropological and sociological literature is that the introduction of television has widespread effects on society, and that gender and social issues are particular focal points. Our data and setting provide an opportunity to test this hypothesis more rigorously.

II.B. Placement and Timing of Cable Access

In moving to a more quantitative analysis of the impacts of cable, we must recognize that variation in access is certainly nonrandom. Therefore, understanding the determinants of the timing and placement of cable is important for our ability to attribute changes in women's status to the introduction of cable itself.

To determine what drives the introduction of cable, we first conducted interviews with cable operators in Tamil Nadu. In these interviews, the operators emphasized two primary considerations:

access to electricity and distance to the nearest town or city. Electricity is, of course, a fundamental requirement for television. Distance is important because most operators who provide service to rural villages reside in towns or cities. Greater distances (i.e., more remote villages) increase the operator's costs, because they often must personally travel to the village to monitor the cable setup (to ensure that it is working properly and that no unauthorized users are connecting to it), collect payments, make repairs or update equipment, or add new subscribers.[3] For the remotest villages, a single trip could require an entire day. As a result, villages closest to larger towns were served first, with more distant villages being covered only after the more profitable villages were taken. Income was less often mentioned by operators as a constraint, because charges for cable access are small (about US$1–$2 per month); in separate interviews with companies marketing televisions, however, this was more of a concern. Overall, most cable operators reported that variation in access was driven largely by costs, and changes in costs, on the part of the providers themselves, rather than being demand driven. In fact, several stated that they believed demand was universal (at least in Tamil Nadu), and the only constraint on provision was the operator's costs.

In addition to these interviews, we conducted a survey of cable operators in Tamil Nadu, gathering information on cable access for over 1,000 rural villages in Tamil Nadu (these data are described in more detail in Section V). For 220 of villages in our survey that do not have cable as of 2008, surveyors recorded the reason(s) given for lack of access. For a majority of the villages (62%), the main reason was that the village was too far away; the other major reason (30%) was that the village was too small to support cable.

The cable operator data can be used to examine the determinants of cable access more quantitatively by merging villages with administrative data from an education database (again, described in more detail in Section V). Doing so allows us to examine the village-level relationship between cable access and the correlates suggested above: distance to a town, population, and electrification.[4] Panel A of Table I shows bivariate correlations

3. Outside of major cities, many of these operators are fairly small businesses, serving from a handful to a dozen or so villages, and so much of this work is done by the individual entrepreneurs themselves.

4. Electricity in the village is inferred from information about electricity in the schools and population is only for children ages 6–14.

TABLE I
CORRELATES OF CABLE PLACEMENT

	(1)	(2)	(3)	(4)
	A. Bivariate correlations			
First variable:	Have cable 2008	Year cable introduction	Have cable in 2003	
Sample:	Tamil Nadu	Tamil Nadu	SARI	
Second variable				
Electricity (0/1)	.2871*** [1,047]	−.1700*** [690]	.4183*** [180]	
Log dist. to nearest town	−.1978*** [1,040]	.1347** [685]	−.3887*** [180]	
Village pop. (1000s)	.2310*** [1,040]	−.2028*** [685]		
Pop. density (1000s)			.1610* [136]	
Ave. log HH income PC			.1749** [180]	
Ave. education			.4628*** [180]	
	B. Regression analysis of cable placement			
Dependent variable:	Have cable 2008	Year cable introduction	Have cable in 2003	
Sample:	Tamil Nadu	Tamil Nadu	SARI	SARI
Explanatory variables				
Electricity (0/1)	.2301***	−1.1834***	.276**	.122
	(.029)	(.353)	(.109)	(.139)
Log dist. to nearest town	−.1111***	.6463***	−.076	−.086*
	(.021)	(.233)	(.050)	(.045)
Village pop., age 6–14, (in '000s)	.1808***	−1.4351***		
	(.036)	(.35)		
Pop. density (in '000s)			.590*	.245
			(.313)	(.302)
Ave. log HH income PC			−.015	.073**
			(.049)	(.047)
Ave. education			.074***	.033
			(.021)	(.022)
State FE	N/A	N/A	NO	YES
Number of observations	1,039	670	136	136
R^2	.13	.07	.26	.43

Notes. Panel A shows the village-level bivariate correlation between each variable and the corresponding cable access variable. Numbers of observations are in square brackets. Panel B shows the village-level determinants of having cable in regression form. Columns (1) and (2) use a sample from Tamil Nadu; columns (3) and (4) use the SARI sample, from five states. Standard errors (in parentheses) and significance level are reported in regressions; significance levels are indicated in the correlations.

*Significant at 10%.
**Significant at 5%.
***Significant at 1%.

between these variables and having cable in 2008 (column (1)) and year of cable introduction among villages that have cable in 2008 (column (2)). Consistent with the reports from cable operators, villages that are farther from a town get cable later and are overall less likely to have cable in 2008, whereas having electricity

or a larger population has the opposite effects. We see similar patterns in the multivariate regressions in Panel B.

We can also use information from our other data source, the Survey of Aging in Rural India (SARI), to do a similar analysis of the village-level determinants of having cable at the time of the final survey in 2003; the sample size is smaller, but the survey has more variables and was conducted in five states. Column (3) in Panel A of Table I reports bivariate correlations between cable access and electricity, distance to the nearest town,[5] population density, and average income and education. The results are similar to those from the Tamil Nadu data. Panel B shows multivariate regressions with these variables and, in column (4), includes state fixed effects to capture the fact that access varies significantly across states. The broad patterns remain the same. In these data, there is some evidence of a role for income as a determinant of cable access, suggesting it may be important to control for it even though it was not explicitly mentioned by cable operators.

These quantitative results are supportive of the qualitative evidence from the interviews and suggest the importance of controlling for these determinants of cable access in our analysis. Under the assumption that these variables constitute the primary determinants of access, controlling for them should allow us to more convincingly attribute the changes in the outcomes to the introduction of cable. Note, however, that the R^2 values in the regressions in Table I are small, indicating that much of the variation in cable access remains unexplained. One possibility, of course, is that other than these important variables, entrepreneurs choose where and when to introduce cable somewhat arbitrarily, or at least based on factors that are unlikely to have an independent effect on women's status.[6] But we certainly cannot rule out that there is some important variable that drives cable introduction that was not mentioned by cable operators and that also has an impact on our outcomes of interest.

Given this, it is important to look directly at whether the introduction of cable is predictable from the levels of, or changes in,

5. The SARI survey did not define "town" for the purposes of measuring distance, and so there is likely to be some variation across villages in what this variable measures.

6. And indeed, this possibility is consistent with some of the reports of cable operators in our interviews. For example, some operators said they had chosen particular villages because they were the home villages of the person who cleaned their office or the woman in the market they bought vegetables from.

our dependent variables. Online Appendix Table W.1 shows that, conditional on the simple controls used above, adding cable during the sample period does not appear to be systematically related to initial levels of our measures of women's status (discussed in more detail in the next section).[7] In most cases, the coefficient on adding cable is close to 0. In fact, villages that later add cable are initially slightly *more* inclined to report that domestic violence is acceptable and have higher initial levels of fertility. In addition to these results, we will show evidence later that getting cable in future years is not predictive of changes in outcomes. However, what we cannot rule out with our data is that there is some important unobservable that was not mentioned by cable operators that simultaneously drives year-to-year cable introduction and year-to-year variation in our outcome measures; although this seems unlikely, and we are unable to think of plausible examples, it is important to keep this caveat in mind.

III. Data and Empirical Strategy

III.A. Data: Survey of Aging in Rural India

Our primary data set is SARI, a panel survey of 2,700 households, each containing a person age fifty or older, conducted in 2001, 2002, and 2003 in four states (Bihar, Goa, Haryana, and Tamil Nadu) and the capital, Delhi. The sample was selected in two stages: in the first stage, 180 villages were selected at random from district lists (40 villages in Bihar, Haryana, and Tamil Nadu; 35 in Delhi; and 25 in Goa), and in the second stage, 15 households were chosen within each village through random sampling based on registration lists. Other than Delhi, the survey was confined to rural areas. Attrition over the panel was low, with just 108 (4%) of the original households dropping out by the third round.

All women in the sample households ages fifteen and older were interviewed (no men were interviewed). Several sections of this survey were modeled to be compatible with other demographic surveys for India, such as the National Family and Health Survey. The survey collected information on a range of (current and past) demographic, social, and economic variables. In addition, a village-level survey with local government officials

7. Online Appendix Table W.1 appears in Online Appendix W, which is accessible on the authors' websites as well as on the Journal's website. All Appendix tables can be found in this Supplemental Appendix.

gathered information on economic and social conditions and infrastructure. Basic summary statistics on the women included in the SARI sample are provided in Panel A of Table II. Women in the sample have relatively little education (an average of 3.5 years), are predominantly Hindu, and are quite poor, with an average per capita income of around US$35 per month.

The SARI data contain a number of measures of women's status. We begin with two attitude measures: son preference and the acceptability of domestic violence. For the former, women who reported wanting to have more children were asked: "Would you like your next child to be a boy, a girl, or it doesn't matter?" Son preference is defined as wanting the next child to be a boy. For domestic violence, women were asked: "Please tell me if you think that a husband is justified in beating his wife in each of the following situations: If he suspects her of being unfaithful; if her natal family does not give expected money, jewelry, or other things; if she shows disrespect for him; if she leaves the home without telling him; if she neglects the children; if she doesn't cook food properly." The outcome measure we use is the number of situations in which the woman reports that beating is acceptable (0–6).

Summary statistics for these two measures are in Panel B of Table II. Over 60% of women feel that it is acceptable for a husband to beat his wife under at least one of the six situations listed. On average, women report 1.6 situations in which it is considered acceptable. Women are most likely to believe beating is acceptable if a wife neglects her children, goes out without permission, or does not show respect toward her husband. Perhaps surprisingly, being unfaithful is reported as valid justification for violence by slightly fewer women. In terms of son preference, 55% of women who want another child prefer that child to be a boy.[8] The residual is not simply preferring a girl; only about 13% of women want their next child to be a girl, with the remainder reporting that the sex of the child doesn't matter (about one-quarter of the sample) or reporting something else (such as "up to God").

In addition, we analyze the effects on two behaviors associated with women's status: household decision making (autonomy) and fertility. To measure autonomy, women were asked (separately for each of the following activities), "Who makes the following decisions in your household: Obtaining health care for

8. Note that the sample size for this variable is smaller because the question is only asked to women who want more children.

TABLE II
SUMMARY STATISTICS

	Mean	Standard deviation	# Obs
A. Demographic variables on SARI respondents			
Women's years of education	3.6	4.5	9,159
Women's age	31.7	8.7	9,159
Household income per capita (Rs)	1,405	5,508	9,159
Hindu (0/1)	0.859	0.348	9,159
B. Women's status data from SARI			
Want next child to be a boy	0.549	0.498	2,165
Beating ever acceptable	0.621	0.485	9,159
No. of situations beating is acceptable	1.62	1.74	9,159
Husband may hit if:			
Unfaithful	0.244	0.430	9,159
Family doesn't give money	0.204	0.403	9,159
Show disrespect	0.309	0.462	9,159
Go out without telling	0.307	0.461	9,159
Neglect children	0.337	0.473	9,159
Bad cook	0.216	0.412	9,159
Autonomy: Make decision about:			
Health care?	0.567	0.496	9,159
Purchases?	0.556	0.497	9,159
Visits to family/friends?	0.549	0.498	9,159
Autonomy: Need permission to:			
Go to market?	0.562	0.538	9,159
Visit family/friends?	0.676	0.497	9,159
Resp. keeps own money	0.740	0.439	9,159
Average # of children, 2001	2.4	1.9	3,053
Pregnant this year	0.070	0.255	8,028
C. Data on education (SARI and DISE)			
Data from SARI (village level)			
Enrollment rate (fixed cohort ages 6–7 in 2001)	0.761	0.291	411
Enrollment rate (ages 6–10)	0.803	0.210	509
Enrollment rate (ages 11–14)	0.696	0.233	495
Data from DISE			
Total enrollment (fixed cohort ages 6–7 in 2002)	90	139	4,229
Total enrollment (ages 6–10)	209	327	5,163
Total enrollment (ages 11–14)	114	217	3,485

Notes. This table shows summary statistics for the variables used in the paper. Panels A and B use data from the SARI survey for women ages 15 and over; the unit of observation is a woman-year. The data cover years 2001–2003. Son preference questions are asked only to the subset of women who report wanting more children. In the education data in Panel C (for both SARI and the DISE) the unit of observation is a village-year, and the years covered are 2001–2003 (SARI) and 2002–2007 (DISE).

yourself; purchasing major household items; whether you visit or stay with family members or friends?" The possible responses were: "1. Respondent; 2. Husband; 3. Respondent jointly with husband; 4. Other household members; 5. Respondent jointly with other household members." Women were also asked whether they need permission from their husbands to visit the market (one question) or to visit friends or relatives (a second question). Responses were coded on a scale of 1 to 3 (do not need permission, need permission, not permitted at all). Women were also asked whether they are allowed to keep money set aside to spend as they wish. Finally, fertility is measured by asking female respondents if they are currently pregnant. Later, we also use birth histories to construct earlier trends in fertility.

Panel B of Table II reports summary statistics for these measures. For the decision-making variables, we condense the responses to binary indicators for whether the woman participates in the decision (either decides on her own or decides jointly with others in the household). Overall, slightly more than half of women participate in each of the decisions. There is some overlap in these variables, though not as much as might be suggested by the similarity of their means; about 20% of women do not participate in any of the decisions, 25% participate in one, 27% in two, and 29% in three. About one-half of women report needing permission to go to the market and two-thirds need permission to visit family or friends.[9] By contrast, nearly three-quarters of women are allowed to keep money set aside to spend as they wish. However, by most measures, women's autonomy overall is quite low. For our empirical analysis, we redefine the variables so that higher values always indicate greater autonomy, and we average the six variables to generate a single measure ranging from 0 to 1.

Data on cable access in SARI are based on information collected in a village questionnaire that gathered information on a variety of services and infrastructure. Thus cable is measured at the village level, not the individual level. Panel A of Table III provides information on cable access throughout the survey period, which, again, was a time of rapid expansion in access. In our data, 90 of the 180 villages have cable in the first round, and an additional 11 villages added cable by the 2002 survey and another 10 added it by 2003. Finally, 69 villages never get cable during this period (no

9. Although not shown here, about 4% are not permitted to do each of these things.

TABLE III
SUMMARY STATISTICS ON CABLE AVAILABILITY

Year	Number of villages with cable	
	A. Cable availability by survey round, SARI data	
2001	90	
2002	101	
2003	111	
Not during survey	69	
State	Share of villages with cable, 2001 (%)	Number that add cable
	B. Cable availability by state, SARI data	
Bihar	7.5	5
Delhi	97.1	0
Goa	60	4
Haryana	17.5	6
Tamil Nadu	77.5	6
Year	Number of villages with new access	
	C. Year of cable access, Tamil Nadu	
1989	1	
1990	5	
1991	5	
1992	3	
1993	26	
1994	44	
1995	19	
1996	21	
1997	29	
1998	93	
1999	34	
2000	67	
2001	47	
2002	43	
2003	47	
2004	47	
2005	79	
2006	33	
2007	28	
2008 (Jan., Feb.)	5	

Notes. This table shows summary statistics on cable availability. Panels A and B focus on the SARI data, showing access either over time (Panel A) or across state in the first sample year (Panel B). Panel C shows the timing of access in the Tamil Nadu sample.

villages dropped cable). The identification of the effects of cable in this paper relies on the 21 villages that added it in either 2002 or 2003.

There is significant regional variation in access to cable in the SARI data. Panel B of Table III shows the percent of sample villages in each state with access in 2001. Not surprisingly, the capital, Delhi, has essentially universal access. Elsewhere, the two southern states of Tamil Nadu and Goa have very high cable penetration, at 78% and 60% of villages, respectively. By contrast, coverage in the two northern states of Bihar and Haryana is low (7% and 17%). Although this variation may seem extreme, or perhaps an artifact of our particular sample of rural villages, these estimates are consistent with a 2001 national census of villages (NSSO 2003).

III.B. Empirical Strategy

Our basic empirical strategy is to compare changes in our measures of women's status for villages that add cable over the course of the panel relative to those that do not. We run individual-level fixed-effects regressions of each outcome on cable availability (measured at the village level). Denote the outcome for individual i in village v in year t as s_{ivt} and the measure of cable access as c_{vt}. The primary regression estimated is

$$s_{ivt} = \beta c_{vt} + \gamma_{iv} + \delta_t + \tau \mathbf{X_{ivt}} + \epsilon_{ivt}, \tag{1}$$

where γ_{iv} is a full set of individual fixed effects, δ_t is a full set of year dummies, and the other controls, $\boldsymbol{X_{ivt}}$, include household income and a quadratic in age. Our identifying assumption is that villages that added cable would not otherwise have changed differently than those villages that did not add cable. We discuss this in more detail below. Although any fixed village characteristics that determine cable access will be absorbed by the fixed effects, in order to account for any possible differential trends in the outcomes by these factors, we also include in the regressions interactions between a year indicator and state dummies, income, education, age and age-squared, village population density, electrification status, and distance to nearest town. Data for all these variables except income were collected only at baseline, and thus we are only controlling for differential trends based on initial values of these variables, not for actual trends in these variables. Standard errors are adjusted for clustering at the village level.

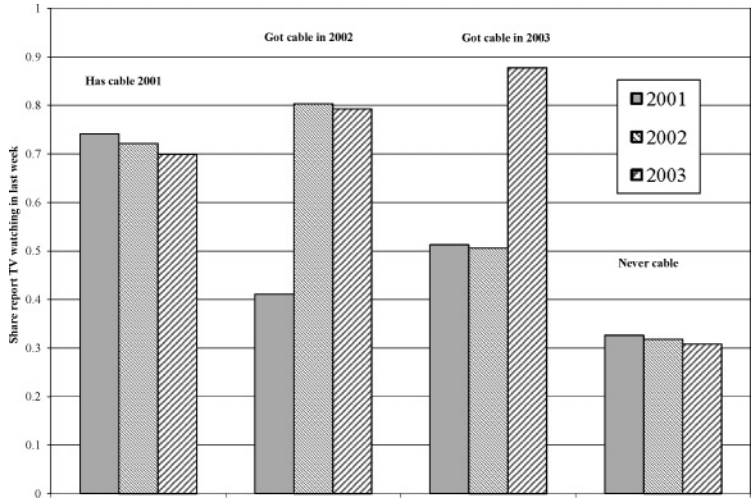

FIGURE I
Cable Access and Television Viewership

This figure shows the average share of people who report watching television at least once in the last week in the SARI data, broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable.

IV. RESULTS: CABLE AND WOMEN'S STATUS

Before turning to the effect of cable on outcomes, it is worth briefly exploring the effect of cable access on TV watching. Because all villages have long had access to broadcast television, it is *ex ante* unclear whether the introduction of cable will change the amount of television watched, which is potentially important as a "first stage" (although cable is likely to change the content of TV watched, even if it does not change the amount, which could also have an effect). We can use the SARI data to provide some information on this question. Figure I shows the percent of women who report they watch television at least once a week (unfortunately, the survey did not gather data on the amount of time spent watching). The graph shows viewership for each year for women in four groups of villages: those that already have cable as of 2001, those that add cable in 2002, those that add cable in 2003, and those that never get cable during our survey. Overall, there is relatively little change in watching over time in either areas that never have had cable or those that always have had it. However, in villages that get cable in 2002, the share of respondents who

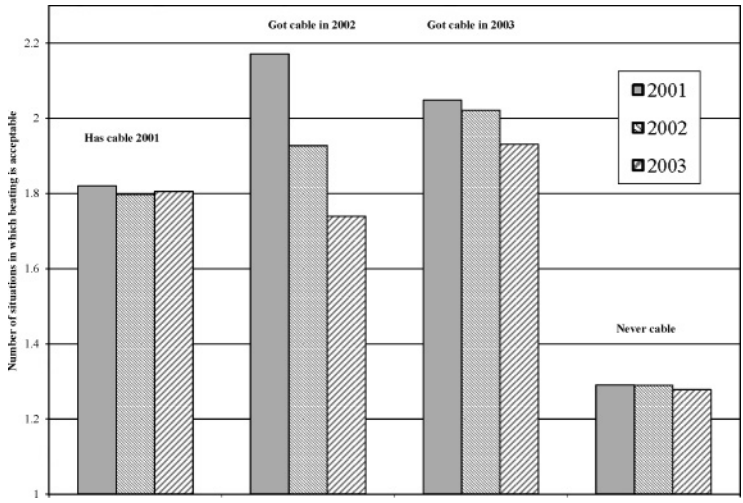

FIGURE II
Cable Access and Attitudes toward Beating

This figure shows attitudes toward beating in SARI (total situations in which beating is reported acceptable), broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable.

report watching television at least once a week jumps from 40% to 80% between 2001 and 2002; in villages that get cable in 2003, this share is constant between 2001 and 2002, and then increases sharply from 50% to 90% between 2002 and 2003. This graph suggests a strong connection between cable availability and television viewership, with a near doubling in both cases.

Having established that cable increases TV watching, we turn to the effects on women's status. Figures II–V mimic the format of Figure I and show the effects of cable access on attitudes toward spousal abuse and son preference, autonomy, and fertility. We begin with attitudes because these are, perhaps, the most likely place to see an effect of cable. Changing behaviors (autonomy, for example) may require coordination with other family members and larger scale changes in lifestyle. Changing attitudes, which may or may not be accompanied by changes in behavior, is the first and most obvious place to look for effects of exposure to other lifestyles and values.

Figure II focuses on attitudes toward beating. The number of situations in which beating is reported to be acceptable by women is relatively unchanged in the villages that don't change cable

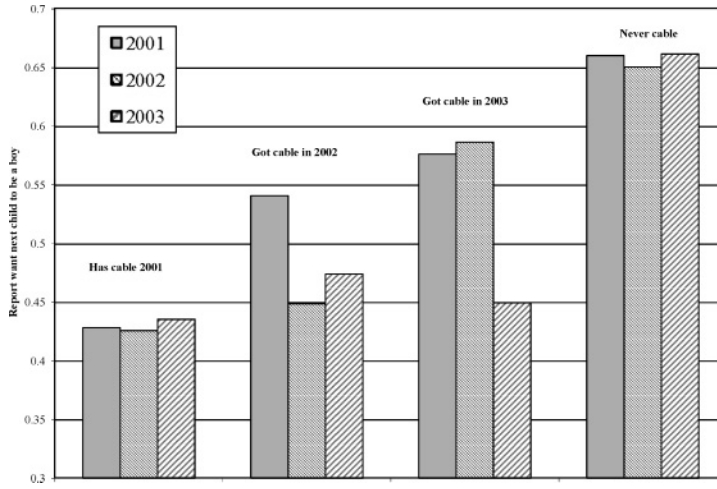

FIGURE III
Cable Access and Son Preference

This figure shows son preference (equal to 1 if the respondent reports wanting a son for the next child) from the SARI data, broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable. The sample is only individuals who report wanting more children.

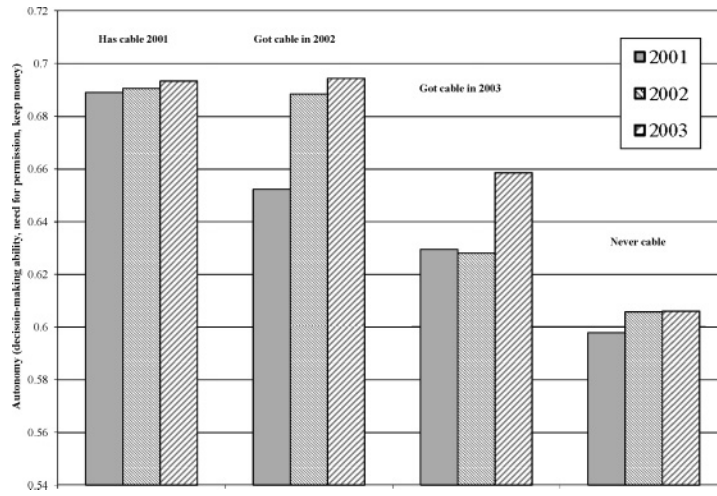

FIGURE IV
Cable Access and Female Autonomy

This figure shows the average of the six measures of autonomy (overall scale from 0 to 1), broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable. Data are from the SARI survey.

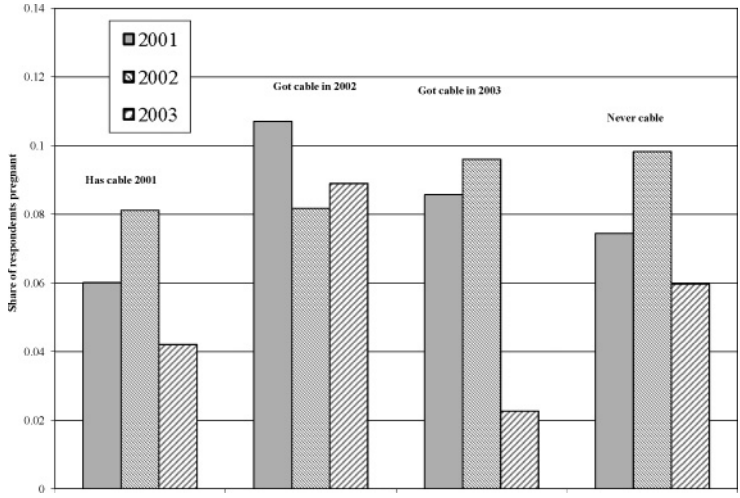

FIGURE V
Cable Access and Pregnancy

This figure shows current pregnancy reported in the SARI data, broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable.

status (either those who always have had cable or never get it). However, there is a large decrease in the average number of situations in which it is considered acceptable between 2001 and 2002 for those that get cable in 2002 and a (somewhat smaller) decrease between 2002 and 2003 for those that get cable in 2003.[10] Figure III shows the same pattern for son preference: reported desire for the next child to be a son is relatively unchanged in areas with no change in cable status, but it decreases sharply between 2001 and 2002 for villages that get cable in 2002, and between 2002 and 2003 (but notably not between 2001 and 2002) for those that get cable in 2003. For both measures of attitudes,

10. The levels in this graph may appear to contradict the finding that cable reduces the acceptability of beating, because villages that always have had cable report on average much higher acceptability than those that never get it. However, this effect is driven largely by villages in Tamil Nadu, which have very high average reported acceptability of beating and high cable access. Adding state fixed effects to a regression of acceptability of beating on cable access eliminates, and in fact reverses, the apparent contradiction. Note that because our empirical analysis focuses on changes rather than levels, this effect will similarly be eliminated. It is worth noting, also, that this issue does not arise with the other outcomes, where the levels are more consistent with the changes. The "outlier" status of Tamil Nadu, with very high levels of acceptability of beating but higher levels of women's status in other dimensions, is consistent with patterns observed elsewhere (International Institute for Population Sciences and ORC Macro 2000).

the changes are large and striking, and correspond closely to the timing of introduction of cable.

Next, we turn to measures that are reflective of behaviors, namely, women's reports of their actual autonomy and fertility. Figure IV shows the effects of cable on female autonomy. Again, as in Figures II and III, we see no change in autonomy for areas with no changes in cable but large increases in autonomy in villages that add cable, and these changes again coincide closely with the timing of cable introduction. Finally, Figure V shows effects on fertility. Although the fertility data are noisier because the sample sizes are smaller, we see roughly the same pattern. There is no particular trend for areas that always have had or never get cable, but for areas that get cable in 2002 there is a decrease in fertility between 2001 and 2002, and for those that get cable in 2003 there is a decrease between 2002 and 2003.

Panel A of Table IV turns to results from fixed-effect regressions of the form in equation (1).[11] Columns (1) and (2) show the attitude results, which are consistent with the previous graphs. Adding cable is associated with a 12-percentage-point decrease in the reported preference to have the next child be a boy, and a 0.16 decrease in the number of situations in which it is considered acceptable for a man to beat his wife (relative to a base of 1.61). Column (3) shows the autonomy effects; again, consistent with Figure IV, the effect of cable is positive and statistically significant, improving the autonomy index by 0.026, from a base of about 0.65. This table also reports means and standard deviations of the outcome variables, to give a sense of the magnitude of the results. Column (4) shows the effect of cable on reported pregnancy during the sample period. Getting cable leads to approximately a 3.7-percentage-point decrease in the likelihood of pregnancy. This effect is extremely large. However, with our data, we are unable to determine whether the reduction in current pregnancies reflects a decline in the total number of births a woman will have, or simply increased spacing of births (though even the latter would reflect gains for women and, potentially, their children).

As mentioned above, the most significant issue facing the basic difference-in-difference results presented above is the

11. Online Appendix Table W.2 shows these regressions without the individual fixed effects for the interested reader, in specifications both excluding and including village fixed effects. The regressions with village fixed effects look very similar to those with individual fixed effects; the regressions without either set of fixed effects look quite different.

TABLE IV
EFFECT OF CABLE TELEVISION ON WOMEN'S STATUS, SARI DATA

Dependent variable:	Beating attitudes (1)	Son preference (2)	Autonomy (3)	Pregnant at survey time 2001–2003 (4)	Pregnant at survey time 1997–2003 (5)
A. Baseline effects of cable					
Explanatory variable					
Village has cable	−.1608**	−.0882**	.0260***	−.0379***	−.0678**
	(.073)	(.040)	(.006)	(.013)	(.028)
Dep. var. mean (SD)	1.70	0.57	0.64	0.072	0.13
	(1.75)	(0.49)	(0.21)	(0.26)	(0.35)
Number of observations	7,014	1,699	7,014	7,014	11,488
R^2	.01	.01	.01	.01	.01
B. Effects of future cable					
Explanatory variables					
Village has cable	−.1516**	−.0881**	.0248***	−.0414***	−.0762**
	(.076)	(.039)	(.006)	(.013)	(.031)
Cable next year	.0440	.0004	−.0053	−.016	−.0253
	(.049)	(.016)	(.004)	(.011)	(.024)
Number of observations	7,014	1,699	7,014	6,959	11,488
R^2	.01	.01	.01	.01	.01

Notes. This table shows the impact of cable TV access on attitudes toward spousal beating (column (1)), son preference (column (2)), female autonomy (column (3)), and fertility (columns (4) and (5)). Columns (1)–(4) include only the survey years, and the dependent variable is reported for attitudes, autonomy, or pregnancy. Column (5) includes 1997–2003, with pregnancy data constructed from the birth history data and excluding women in villages that have cable in 2001 because we cannot identify when they received it. Panel A includes only a measure of whether the village has cable this year. Panel B also includes a control for whether the village gets cable next year, to test for pretrends. Controls in columns (1)–(4) include individual fixed effects, year fixed effects, age, age-squared, income this year, and a linear control for year interacted with each of the following: age, age-squared, education, income this year, electricity, distance to nearest town, village population density, and state dummies. Controls in column (5) include individual fixed effects, year fixed effects, age, age-squared, and a linear control for year interacted with age and age-squared. Standard errors are in parentheses, clustered by village.

*Significant at 10%.
**Significant at 5%.
***Significant at 1%.

possibility that some unobserved variable—for example, attitudes toward "modernity"—is driving both the introduction of cable and changes in women's status. Because variables such as this are likely to change gradually over time rather than suddenly or all at once, we might expect these effects to be evident in the form of preexisting trends in the data. That is, we would see changes in the outcomes of interest anticipating changes in cable access, because an outside variable would be driving both. We can look for evidence of this possibility first in Figures II–V. In particular, although we have a limited panel, and therefore limited scope for this test, we can look at whether villages that got cable in 2003

show evidence of changes in women's status between 2001 and 2002. In no case do we see evidence for this—women's status in these villages is largely unchanged between 2001 and 2002 across all measures, and then changes sharply between 2002 and 2003. The close correspondence between the introduction of cable and sudden changes in the measures of women's status suggests a direct link between the two, rather than preexisting trends in the outcomes.

We can test statistically for the possibility of pretrends more formally by including in the regressions above an indicator for getting cable *next* year. This coefficient is identified from the changes between 2001 and 2002 for the ten villages that add cable in 2003, *plus* changes between 2002 and 2003 for four villages that were recorded to have gotten cable within three months of the 2003 survey.[12] The results in columns (1)–(4) of Panel B of Table IV indicate that the effect of getting cable this year is largely unchanged, compared to Panel A, and more importantly that getting cable one year later does not predict changes in women's status. In other words, it does not seem that there are changes in the outcomes that anticipate getting cable. Note that not only are these coefficients not statistically significant, but the point estimates are extremely small, and in most cases statistically significantly different from the effect of getting cable this year—so we can reject that any changes observed after cable is introduced are simply the continuation of preexisting trends.

In addition to this evidence, for fertility (only) we can use birth histories to examine for preexisting trends over a longer period. Women in the survey were asked to report on each of the children to which they had given birth. We can use these data to construct measures of whether they were pregnant in previous years, during the same survey month. For example, for women interviewed in June 2001, we can determine whether the woman was pregnant in June 2000 based on whether she reported giving birth any time between June 2000 and March 2001. We can similarly construct measures of pregnancy going

12. Our survey team returned to all sample villages three months after the 2003 survey in order to gather some additional data, which allowed us to identify four villages that had added cable after the survey. One question with these regressions is how to treat villages that do not have cable in 2003. Some of these village might have gotten cable between our return survey and 2004, although most of them will not have. In Panel B of Table IV, we include these villages and assume they did not get cable, which preserves the sample sizes and comparability to Panel A. However, we have run these analyses excluding these villages and the results are very similar (available from the authors).

back several years (we go back only until 1997).[13] This measure will of course be imperfect; for example, women in the early stages of pregnancy may not know or may not report they are pregnant, leading to lower apparent pregnancy rates when measured by directly asking about current pregnancies. On the other hand, because many pregnancies result in spontaneous or induced abortions rather than births, estimating presurvey pregnancies by counting backward from presurvey births will lead to an undercount. Although these measurement difficulties make our estimated effects of cable on pregnancies less precise, they should not lead to bias because they should not be systematically correlated with whether the village has cable. However, for the sake of consistency, when we generate the presurvey pregnancy measures, we adjust the reported pregnancy levels upward.[14]

In column (5) of Table IV we use this longer, constructed panel of fertility to control for village-specific fertility trends. While this approach adds additional years of data, we have to exclude any villages that have cable in 2001, because we do not observe when they get cable. Even with the inclusion of the village-specific fertility trends, the coefficient on cable is negative and significant, indicating that the addition of cable produces a net-of-trend drop in pregnancy.[15] In fact, the point estimate is increased by the inclusion of these trends, suggesting that relative to villages that did not add cable, those adding cable were if anything actually experiencing increasing trends in fertility prior to the introduction of cable (though we would not reject that the coefficients in the two regressions are equal). Finally, column (5) of Panel B again shows no effect of future cable.

Overall, the results in Table IV and Figures II–V suggest that the introduction of cable in these rural villages led to an improvement in the status of women, visible in changes in both

13. Although it is possible to go back further, evidence from validation studies of fertility histories finds that there is underreporting of births, especially when the child later dies, for births more than five years in the past but little such underreporting of births in the previous five years (Bairagi et al. 1997).

14. We do this by comparing reported pregnancies in the 2001 survey to estimated pregnancies based on reported births in the 2002 birth history. The adjustment factor is 1.43, suggesting that women start reporting pregnancy when they are around three months pregnant, which seems realistic. It is worth noting that this adjustment addresses the possibility of both undercount and overcount by simply estimating the factor that makes the two measures comparable.

15. As noted in Section III, only 21 villages in the SARI data change their cable status during the sample. This could lead to the concern that the results presented here are driven by outliers; however, we have run all of the SARI regressions, leaving out each "changer" village in turn, with no noticeable effect on the results (results available from the authors).

attitudes and behaviors. Although improving women's status is an important goal in and of itself, several authors have argued that human capital investments in children are greater when women have higher status within the household (see, e.g., World Bank [2001, 2006]; Qian [2008]). We therefore turn now to looking at one specific outcome, education.[16]

V. Results: Cable and Education

Our analysis of schooling makes use of two data sets: the SARI data and administrative data on school enrollment from Tamil Nadu.

V.A. SARI Data Analysis

The household roster file in the SARI survey records whether each child in the household is enrolled in school. We aggregate these data to the village level, and analyze the effect of cable access on school enrollment via three distinct groups. First, we follow enrollment among a fixed cohort of girls and boys ages 6–7 in the first survey year (2001) as they progress through school over the course of the panel. Second, we examine enrollment by sex for children ages 6–10 in the given survey year (i.e., this does not follow the same students over time; students age five in 2001 enter the group when they turn six in 2002, and students age ten in 2001 exit the group in 2002 when they turn eleven). Finally, we similarly examine enrollment by sex for children ages 11–14 in the given survey year. Summary statistics for these variables are in Panel C of Table II.

Echoing the format of previous figures, Figures VIa and VIb illustrate the basic results using enrollment for children ages 6–14. Focusing first on girls, although the results are noisier than for women's status, we do see evidence for an impact of cable on school enrollment. In the villages that do not change cable status, enrollment is either flat or slightly decreasing over the sample period. For those that get cable in 2002, enrollment increases between 2001 and 2002, and then further increases between 2002 and 2003, suggesting some increasing impact over time. For those that get cable in 2003, enrollment decreases from 2001 to 2002 (consistent with the change in villages that always have had cable) but increases from 2002 to 2003. Figure VIb, for

16. It is worth noting, of course, that the effects of cable on education may be interesting in their own right, regardless of the link with women's status.

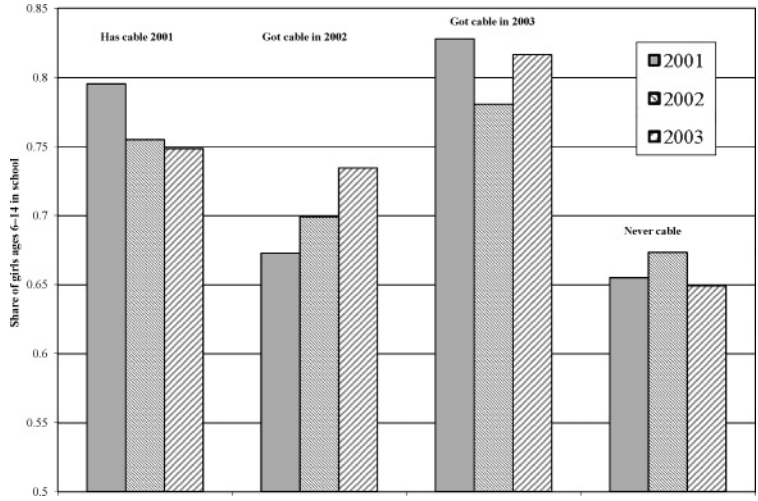

FIGURE VIa
Cable Access and Education in SARI, Girls 6–14

This figure shows school enrollment for girls ages 6–14, broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable.

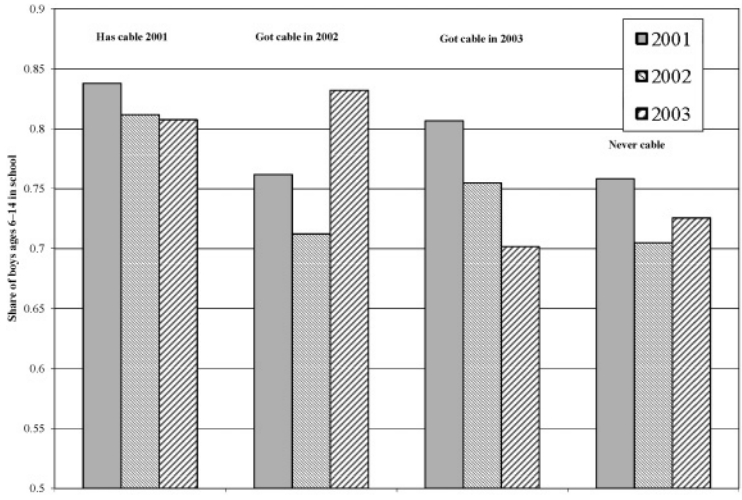

FIGURE VIb
Cable Access and Education in SARI, Boys 6–14

This figure shows school enrollment for boys ages 6–14, broken down by villages that always have had cable, those that got cable for the first time in 2002, those that got it for the first time in 2003, and those that never have had cable.

boys, shows less clear results and, in particular, does not appear to demonstrate any "on-introduction" impact of cable: moving from 2001 to 2002 in the 2002 adopters or 2002 to 2003 in the 2003 adopters does not appear to increase enrollment. However, there is a large increase between 2002 and 2003 for the 2002 adopters, again perhaps pointing to a delayed effect. Although the results for women's status suggests immediate on-introduction effects, it is possible that any effects on education could take longer, for example, because plans for education must be made further in advance and money must be saved for fees and other costs.

Table V turns to the regression results. The format of regressions is the same as in the analysis of women's status, although the controls are village-level averages and village fixed effects replace individual fixed effects.[17] Panel A presents the basic results. In columns (1) and (2), which focus on the fixed cohort of children ages 6–7 in 2001, the coefficients for both groups are positive, though neither is statistically significant. Columns (3) and (4) focus on children ages 6–10 and reveal a large (12 percentage points) and statistically significant increase in enrollment for girls but no effect for boys. Columns (5) and (6) look at older children, where there is no effect for either sex. Panel B explores whether there is evidence of a delayed effect of cable on school enrollment, as was suggested by Figures VIa and VIb. The regressions include an indicator for having cable for one year and having cable for two years.[18] The sample excludes the 2001 data for villages that have cable in 2001 because we do not know how long they have had cable; by 2002 we know they must have had cable for at least two years, and so we include the data for 2002 and 2003. The evidence in Panel B does show some evidence of a delayed effect—the coefficients on having cable for two years are typically larger than for having cable for one year. Again, though, the results are only statistically significant for younger girls. The fact that we do not find effects for older children may reflect the higher costs of sending older children to school (both direct outlays and opportunity cost) or that many older children have already left school and it is difficult to return after having dropped out.

17. Analysis using individual-level enrollment data, reported in Online Appendix Table W.3, yield similar results.

18. Because the variable for having cable for two years can only be 1 for villages that add cable in 2002, this result could also reflect in part a larger impact for those villages relative to those that add cable in 2003, instead of or in addition to any increasing impact of cable.

TABLE V
EFFECT OF CABLE ON EDUCATION, SARI DATA

	Dependent variable: Enrollment rate among					
	Fixed cohort, ages 6–7 in 2002		Ages 6–10		Ages 11–14	
	Girls (1)	Boys (2)	Girls (3)	Boys (4)	Girls (5)	Boys (6)
A. Effect of cable						
Village has cable	.0777	.0332	.1177***	−.0088	−.0378	−.0083
	(.049)	(.084)	(.041)	(.08)	(.071)	(.086)
Number of observations	363	357	393	403	378	400
R^2	.05	.06	.10	.02	.06	.09
B. Effect of cable by years of access						
Cable for one year	.1075*	.0543	.1522***	−.0778	−.0725	−.0135
	(.061)	(.099)	(.052)	(.086)	(.082)	(.097)
Cable for two years	.1771**	.1070	.1692***	.1193	−.0517	−.0041
	(.081)	(.099)	(.047)	(.091)	(.103)	(.09)
Number of observations	318	308	337	346	326	344
R^2	.04	.11	.12	.06	.08	.11
C. Effect of future cable						
Village has cable	.0828*	.0489	.1134***	−.0169	−.024	−.0038
	(.049)	(.084)	(.041)	(.08)	(.073)	(.087)
Cable next year	.0249	.0715	−.0186	−.041	.0633	.0291
	(.052)	(.05)	(.046)	(.036)	(.053)	(.051)
Number of observations	363	357	393	403	378	400
R^2	.06	.08	.11	.04	.09	.12

Notes. This table shows the impact of cable access (whether the village has cable and years of cable access) on school enrollment in the SARI data. Columns (1) and (2) consider enrollment rate among a fixed cohort ages 6–7 in 2001, columns (3) and (4) limit to children ages 6–10, and columns (5) and (6) limit to children ages 11–14. Controls in all regressions include village fixed effects, year fixed effects, average child age-squared, average yearly income, and a linear control for year interacted with each of the following: age, age-squared, education, income this year, electricity, distance to nearest town, village population density, and state dummies. Standard errors are in parentheses, clustered by village.

*Significant at 10%.
**Significant at 5%.
***Significant at 1%.

In Panel C of Table V, we address the issue of possible pretrends as we did above, by including an indicator for getting cable in the next year. As above, the inclusion of this variable does not markedly change the effects of cable access and we see no evidence that changes in enrollment anticipate cable introduction.

V.B. DISE Data Analysis

We provide additional evidence on the impact of cable on education using a second data set of administrative data on schools

from Tamil Nadu compiled as part of the national District Information System for Education (DISE).[19] The records contain data on enrollment and school characteristics for each school in Tamil Nadu yearly for the 2002–2003 through 2007–2008 school years. Using these data, we construct enrollment measures that parallel the SARI data. We first follow enrollment by sex for a fixed-age cohort who are 6–7 years old in the 2002–2003 school year.[20] In addition, we separately analyze enrollment by sex of children age 6–10 and 11–14 in each year. Summary statistics for these variables are in Panel C of Table II.

To match the DISE data, we gathered information on cable access for 1,061 villages in Tamil Nadu in March and April 2008. To select the villages, we identified five districts that had low cable penetration in 1998 (the latest year for which we have data from a separate survey, the 1998 National Family Health Survey, that allow us to identify district-level cable penetration). We chose low-access districts because our empirical analysis relies on comparing villages that added cable to those that did not, and districts with high cable penetration rates in 1998 would have had few villages adding cable after 2002 (the first year of the DISE data). Within these five districts (Salem, Tiruvannamalai, Pudokkottai, Sivaganga, and Ramanathapuram), we randomly selected a total of nineteen blocks (administrative units comprising groups of villages) and gathered information on all villages within those blocks.

Surveyors were sent out to block headquarters to locate cable operators. For each village in the block, the surveyor asked the operators whether the village had cable, and in what year they got it. Approximately 63% of the villages in the sample had cable at the time of the survey, with starting dates ranging from 1989 through 2008. For the 2002 to 2007 period covered by the administrative education data, 394 villages already had cable in 2002, 277 added cable during the period, and 390 never got cable. Panel C of Table III shows the number of villages receiving cable for each year.[21] These data show that the period covered by the DISE

19. These data were obtained on CD from the Tamil Nadu district education office in Chennai.

20. Note that this is close to what we do in SARI, but not identical; in the SARI data we can actually follow the same children over time. In the DISE data, we cannot be sure that the seven- to eight-year-old children in 2003 are the same as the six- to seven-year-old children in 2004. In this sense we are following a cohort of fixed age, but not fixed individuals.

21. A number of villages are recorded as having had cable at some point but then losing it. Most such cases involved switching from traditional cable access

data represents a time of significant cable expansion in these blocks.[22]

The DISE data have several advantages relative to the SARI data, including providing objective, rather than self-reported, enrollment data, and a longer time series (valuable for checking for pretrends) with more variation in the timing of access. A significant limitation of these data, however, is that records provide only raw enrollment numbers, and for most villages we have child population data for only one year of the survey (2005). As a result, we can analyze only total enrollment, not enrollment rates. Finding an effect of cable access on enrollment in these data is therefore consistent with either an increase in enrollment rates *or* an increase in total school-age population with no changes in the likelihood of enrollment. This is not an issue in the SARI data where we have a fixed population over time. Although with these data we are unable to fully address this issue, below we provide two pieces of evidence that, although only suggestive, do point to an enrollment effect rather than population growth.

One other challenge is that our village survey only reported the year the village got cable, not the month. This makes it difficult to match with precision the timing of cable introduction and school enrollment. For example, villages that received cable in 2002 may have added it in August, when it was already too late to influence the decision on whether to enroll a child in the 2002–2003 academic year, because the school year begins in early June and late enrollment is generally not permitted. This suggests that the effects of cable on enrollment in many cases may not show up until at earliest the academic year starting in the calendar year after cable is introduced. To capture this and any other potential delayed (or increasing) effects of cable, our empirical analysis will analyze the effect of both having cable and years of cable access.

(an entrepreneur with a satellite dish sells cable connections) to direct-to-home (DTH) satellite service. We code these villages as having cable, because DTH provides access to the same programming available through cable. However, 28 villages are recorded as having lost cable for some other reason (such as failure to pay or problems with local partners). In these cases we know the beginning and ending dates of cable access and code the access accordingly. Dropping year*village observations after service is dropped to allow for the possibility of persistent or delayed effects of cable does not change the results appreciably.

22. Table III shows some evidence of "bunching" of cable access at 2000 and 2005. This may be due to misreporting or rounding in the reports by the cable operators. We have run the analysis excluding villages getting cable in 2000 or 2005 and find no significant differences (results available from the authors).

Using these data, we follow a specification similar to that above, regressing log enrollment on whether the village has cable and years of cable access. To account for possible serial correlation, we use the Prais-Winston estimator. The controls include electrification (inferred from whether the school has electricity), population,[23] and distance to the nearest town.[24]

The primary results are in Panel A of Table VI. Although there is no on-introduction effect of cable (the coefficient on having cable is small and insignificant) for the fixed cohort and for children under ten, there is strong evidence that continued exposure to cable (years of access) increases enrollment. For the fixed cohort ages 6–7, the effect is large, with additional years increasing enrollment by 5%. For children ages 6–10, the effect is smaller, between 1% and 2%, but still statistically significant. Finally, consistent with the SARI data, we see no effect for the older group.

We can see some visual evidence of the results in Table VI for the fixed-aged cohort (including both sexes) in Figure VII. These graphs show the changes in enrollment over time, by date of cable adoption, relative to areas that never get cable. Although the figures lack the sharpness of the SARI figures, we do see evidence of increases in enrollment after cable is introduced.[25]

Because there is some suggestive evidence that the effect of cable on enrollment increases over time, in Panel B of Table VI we estimate the regressions excluding villages that already have cable in 2002. Doing so eliminates the increased enrollment for this portion of the previous "control group" that was still experiencing gains from having recently added cable. The coefficients are of similar magnitude, though there is some loss of precision due to the smaller sample size.[26] In Panel C of Table VI, we use all villages but include a linear control for year interacted, with block dummies to allow for differential trends by block. The results are little changed in terms of magnitude, though in some cases they

23. The population data available in the DISE data are for children ages 6–14, which is a reliable proxy for overall population only under the assumption that dependency ratios are not systematically different across village types.

24. We attempted to include additional controls by merging our data with data from the Census, but differences in village names meant we would be able to match only half of the DISE villages.

25. Online Appendix Figures W.1 and W.2 show these graphs separated by sex.

26. Note that in contrast to the SARI data, the coefficient on "years of cable" in this case *is* identified partially from villages that already have cable in 2002, because they change their years of cable over the sample period, even if they do not change whether they have cable at all.

TABLE VI
EFFECT OF CABLE ON EDUCATION IN DISE DATA

Sample:	Fixed cohort, ages 6–7 in 2002		Ages 6–10		Ages 11–14	
	Girls (1)	Boys (2)	Girls (3)	Boys (4)	Girls (5)	Boys (6)
A. All villages, no block trends						
Explanatory variables						
Village has cable	.0418	.0233	−.0142	.0055	−.0766	−.1185*
	(.041)	(.042)	(.015)	(.016)	(.066)	(.067)
No. of years access	.0529***	.054***	.0095**	.0195***	.0077	.0047
	(.014)	(.014)	(.005)	(.005)	(.02)	(.021)
Demographic controls	YES	YES	YES	YES	YES	YES
Block-specific trends	NO	NO	NO	NO	NO	NO
Number of observations	4,289	4,308	5,165	5,164	3,578	3,563
B. Villages with cable after 2002, no block trends						
Explanatory variables						
Village has cable	.0409	.0205	−.0128	.0032	−.0497	−.1004
	(.042)	(.041)	(.016)	(.017)	(.066)	(.068)
No. of years access	.0518**	.0735***	.0004	.0184**	−.045	−.0199
	(.022)	(.022)	(.008)	(.008)	(.031)	(.033)
Demographic controls	YES	YES	YES	YES	YES	YES
Block-specific trends	NO	NO	NO	NO	NO	NO
Number of observations	2,428	2,439	3,025	3,025	2,009	1,988
C. All villages, block trends						
Explanatory variables						
Village has cable	.0578	.0382	−.0075	.0144	−.0147	−.0776
	(.042)	(.043)	(.016)	(.016)	(.067)	(.068)
No. of years access	.0652***	.0693***	.0089*	.026***	.0242	.0118
	(.016)	(.016)	(.006)	(.006)	(.023)	(.024)
Demographic controls	YES	YES	YES	YES	YES	YES
Block-specific trends	YES	YES	YES	YES	YES	YES
Number of observations	4,289	4,308	5,165	5,164	3,578	3,563
D. All villages, control for pretrends						
Explanatory variables						
No. of years access	.0516***	.0523***	.0099**	.0209***	.0029	−.0037
	(.014)	(.014)	(.005)	(.005)	(.021)	(.021)
No. of years until access	.0066	−.0007	−.0016	.0094	−.0423	−.0707**
×−1	(.022)	(.022)	(.008)	(.008)	(.033)	(.034)
Demographic controls	YES	YES	YES	YES	YES	YES
Block-specific trends	NO	NO	NO	NO	YES	YES
Number of observations	4,289	4,308	5,165	5,164	3,578	3,563

Notes. This table reports the effect of cable access on school enrollment in the DISE data from Tamil Nadu. Columns (1) and (2) use a fixed-age cohort, 6–7 years, in 2002; columns (3) and (4) use children under 10 in each year, and columns (5) and (6) use children ages 11–14 in each year. Panel B excludes villages that got cable before 2002. Panel C includes block-specific trends (a block is an administrative unit larger than a village but smaller than a district). Panel D includes a control for years until cable access; this is multiplied by −1, which means that if enrollment is increasing in anticipation of getting cable, the coefficient on this variable will be positive. Controls in all regressions include village fixed effects, year fixed effects, and a linear control for year interacted with population of children ages 6–14, distance to block headquarters, and electricity in school. Standard errors in parentheses are adjusted for serial correlation.

*Significant at 10%.
**Significant at 5%.
***Significant at 1%.

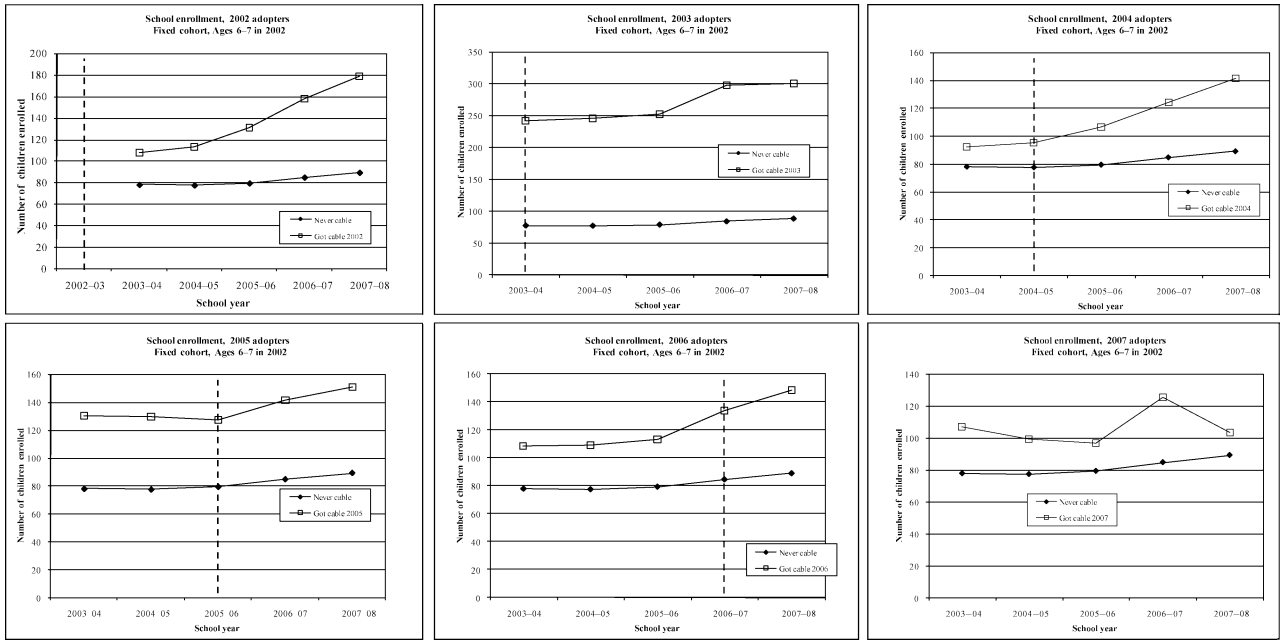

FIGURE VII

Trends in Enrollment, Administrative Data from Tamil Nadu

This figure shows total school enrollment of a fixed cohort of students who are ages 6–7 in 2002, across villages that adopt cable in different years. The data are drawn from administrative data in Tamil Nadu. Dotted lines indicate the first year of possible cable access; because school enrollment decisions are likely made around the middle of the year, only some villages that, for example, get cable in 2005 will have cable during the 2005–2006 school year.

are less precisely estimated. Finally, in Online Appendix Tables W.4 and W.5, we show that the results are broadly robust to several alternative specifications, including analyzing enrollment by grade rather than age, focusing only on access rather than years of access, and specifying years of access as a series of dummies rather than a linear variable.

As with the results above, there is concern over possible pretrends, with other variables driving both increased enrollment and adoption of cable. In fact, this is a greater concern here than above because we measure only total enrollment, not enrollment rates, and population could be increasing more rapidly (and along with it, total school enrollment) in areas adding cable. In Panel D of Table VI we attempt to address this concern by including a control for years of cable and a control for years *until* cable access, with the latter multiplied by -1. If there is an upward trend in enrollment before cable access, we would expect to see a positive effect on the measure of years until cable access (we multiply this variable by -1 for ease of interpretation, so that both a posttrend and a pretrend are indicated by positive values). The results do not suggest pretrends. Although the effects of years of cable remains positive and statistically significant, the effect of years until cable is positive in only two of the cases, and in both, the coefficients are small and not statistically significant. And for both boys and girls ages 11–14, the evidence indicates that in relative terms, enrollment was declining in villages that later added cable, the opposite of what we would be concerned with.

The evidence in Panel D does not, however, rule out the possibility that population increases *after* cable is introduced, such as through higher migration to a village with cable. To test for possible population growth following the addition of cable, we use a subsample of 416 DISE villages for which we have data on school-age population in both 2005 and 2007. For this set of villages, we regressed the change in log population between 2005 and 2007 on an indicator for having cable in 2005. The coefficient and standard error are -0.032 (0.063). Thus, the point estimate is in fact negative, that is, lower (child-age) population growth in villages that added cable, though we are unable to reject that there was no differential change for the two groups. However, we also note that the coefficient is not very precisely estimated, and we therefore cannot rule out large, positive effects of as much as 5% to 10%. So, while there is no evidence here that population trends are driving the results, we cannot fully rule out this possibility.

Taken together, the DISE and SARI data suggest that cable leads to increased school enrollment for younger children. Given the large literature showing that increases in women's status and decision-making authority are associated with gains in children's outcomes, it is certainly plausible that the schooling results are related to the improvements in women's status, such as participation in household decision making, documented earlier. Though of course we can't rule out that enrollment may be influenced by cable through other channels, such as by providing information about the returns to schooling or government programs promoting education.

VI. Discussion and Conclusion

In this paper, we find that the introduction of cable television improves the status of women: women report lower acceptability of spousal abuse, lower son preference, more autonomy, and lower fertility. In addition, cable is associated with increases in school enrollment, perhaps itself an indicator of similar increased status and decision-making authority within the household. Thus, programs to provide televisions, such as the large program currently under way in Tamil Nadu, may in fact have significant implications for important development priorities.

There are several mechanisms through which cable television may affect women's status. For example, television may affect fertility by providing information on family planning services or changing the value of women's time. Or women may be given more freedom to do things outside the home such as going to the market, because the value of men's leisure is increased by television. However, one plausible mechanism is that television exposes rural households to urban lifestyles, values, and behaviors that are radically different from their own and that households begin to adopt or emulate some of these, as suggested by many anthropological and ethnographic studies of television in India (Mankekar 1993, 1998; Fernandes 2000; Johnson 2001; Scrase 2002). Certainly, the differences between rural and urban setting are marked. For example, in our SARI data, the number of situations in which women report that it is acceptable for a husband to beat his wife is 1.4 in rural areas without cable access, compared to 1.0 in urban areas; the mean autonomy measure in urban areas is 0.67, compared to 0.60 for noncable rural areas; and about half of women in urban areas want their next child to

be a son, compared to 67% in noncable rural areas. The addition of cable goes a long way toward closing these gaps, decreasing son preference by 12 percentage points (70%), the autonomy index by 0.025 (41%), and the number of acceptable beating situations by 0.16 (46%). Of course, we cannot causally attribute the changes observed to rural households emulating urban household values and behavior. And certainly, some of the other mechanisms mentioned earlier are likely to play some role. For outcomes such as changes in son preference and attitudes toward beating, however, it is less clear what mechanisms other than changing values and attitudes could be at play.

The possibility that changes in norms, values, or attitudes lie behind these results is particularly intriguing as a contrast to typically proposed approaches to improving education and women's status or reducing fertility. For example, for education, the emphasis is often on reducing poverty, cutting school fees, building schools, and improving school and teacher quality. For fertility, the emphasis is often on factors such as expanding access to family planning goods and services. And efforts to promote women's status are often vague, such as calls to "empower women." In many of these cases, the solutions (such as reducing poverty) are as difficult to accomplish as the problems they are attempting to solve, and potentially can only be achieved over a long time period and with significant resources. Because adding cable television caused none of these intermediate steps such as reducing poverty or cutting school fees, it is arguably the case that some component of these problems is the result of norms and attitudes. Although these other strategies are worthwhile, both in themselves and as solutions to the problems of education, fertility, and women's status, and although cable clearly cannot solve any part of these problems that is in fact related to underlying structural problems such as poverty, the possibility that some of these behaviors may be changed largely because of changes in attitudes, cheaply and quickly supplied by TV, offers significant promise.

As we think about policy, however, it is worth noting that the effects estimated in this paper may be larger than what would be expected if cable were introduced more widely. Although we have argued that preexisting trends in attitudes do not drive the results, we cannot rule out the possibility that television is introduced first into areas that have the biggest potential for change; those that are receptive to television may also be receptive to changing their gender attitudes. Thus, while the effect of cable is

correctly estimated *within sample*, the effect of further introduction may be smaller, or slower. Nevertheless, given the magnitude of the effects estimated here, even much smaller effects could have significant impacts in India.

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