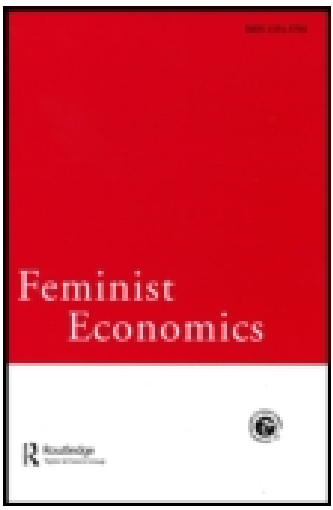

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Women's Empowerment and Gender Bias in the Birth and Survival of Girls in Urban India

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ABSTRACT

Despite improvements in women's work opportunities and educational achievements, women's survival disadvantage is a demographic reality of urban India. A temporal and cross-sectional analysis of the data from the 1991 and 2001 census of India, while reaffirming the positive association between women's employment and the birth and survival of more girls, fails to reconfirm the oft-emphasized positive connection between women's education and increased survival of girls. Relatively high levels of women's education, by being indicative of household socioeconomic status, may be associated with increased ability to discriminate against girls through prenatal sex selection, especially in the presence of cultural biases resulting in low women's rates of participation in paid work, persistence of dowry payments, and lack of women's property rights. As the educational achievements of urban Indian women improve, gender discrimination in the birth and survival of girls may intensify as a cumulative effect of socioeconomic factors continuing to favor sons.

KEYWORDS

Economic development, empowerment, gender inequality, child sex ratios, sex ratios at birth

JEL Codes: J11, J16, 053

INTRODUCTION

The relative abundance of women in most parts of the world reflects their biological survival advantage relative to men (Ingrid Waldron 1993, 1998). However, a combination of ''mortality and natality inequality'' (Amartya Sen 2001) traditionally operating through differential allocation of care to girls and boys, cases of infanticide, and more recently prenatal sex selection has skewed child sex ratios (CSRs) and sex ratios at birth (SRBs) heavily toward boys in some countries of South Asia (India, Pakistan, and Bangladesh), East Asia (People's Republic of China, Taiwan, and South Korea), and Southeast Asia (Vietnam).[1] This survival disadvantage of girls

during the early years, reflected in relatively fewer surviving women in these regions, is possibly the starkest form of gender inequality in today's world. While a historical study reveals that most societies have had predominantly patriarchal institutions and a strong preference for male vis-à-vis female offspring (David E. Bloom and Gilles Grenier 1983), economic development has often coincided with waning – if not disappearing – son preference in several parts of the world (Shelly Lundberg 2005). The preference for sons and the relative survival disadvantage of daughters in India continues to be of interest due to its persistence. Much of scholarly research on this issue suggests women's empowerment through education and paid work participation is important for shifting the balance of parental preferences toward daughters (see for example Barbara D. Miller [1981]; Sunita Kishor [1993]; Mamta Murthi, Anne-Catherine Guio, and Jean Drèze [1995]; Satish Balram Agnihotri [2000]). However, anticipated outcomes notwithstanding, recent census data continues to show women's survival disadvantage, even with higher educational achievements, frustrating scholars and policymakers alike (Sen 2001).

Most studies of the relative survival disadvantage of women in India have focused on the country as a whole, or exclusively on rural India. Though there are studies that focus on the impact of urbanization on gender bias (Jocelyn Kynch and Amartya Sen 1983; Murthi, Guio, and Drèze 1995; Stephan Klasen and Claudia Wink 2003), no study to date has comprehensively focused on the status of girls and women in urban India. This is possibly on account of two reasons. First, urbanization has often been associated with the improved survival of girls (Nancy E. Williamson 1976) – primarily through greater availability of healthcare and health-related amenities, which reduce health hazards for all children, including girls. It also allegedly fosters a modernization of attitudes leading to and from greater empowerment of women, benefiting girls in particular. This paper engages in analyzing the survival of girls in urban India in the wake of increased urbanization accompanying rapid economic growth in the country by analyzing data from the 1991 and 2001 population censuses of India (Registrar General and Census Commissioner, India 1991, 2001). It is important to mention that the 2011 census of India was recently completed and provisional data from this census show CSRs further tilted toward boys. At the time of drafting this paper, detailed rural–urban breakdown of data and data for SRBs were not available. Hence apart from sporadic references, this paper is not based on the 2011 census.

Table 1 illustrates the achievements women have made in literacy and paid work participation in urban areas in India over the period 1991–2001. Though literacy, according to the census of India, is defined only by the ability to read and write, not necessarily including formal education, and though paid work participation does not reflect the nature of such work, these figures do reflect the increasing integration of women into the public

Table 1 Sex ratios and women's paid work participation and literacy rates in urban India, 1991 and 2001

	Women's employment[a]			*Women's literacy*[b]			*Child sex ratios (M/F)*			*Sex ratios at birth*
	1991	*2001*	*% change*	*1991*	*2001*	*% change*	*1991*	*2001*	*% change*	*2001*
India	14.08	17.16	21.90	64.05	72.86	13.75	106.99	110.33	3.12	110.62
North	*10.48*	*13.67*	*30.46*	*46.20*	*67.56*	*46.25*	*108.35*	*112.92*	*4.22*	*114.30*
Bihar[c]	8.52	10.82	27.01	55.94	65.65	17.36	105.22	107.97	2.61	110.89
Delhi	11.77	13.94	18.39	68.54	75.22	9.75	109.05	114.99	5.44	117.02
Haryana	8.00	15.54	94.22	64.06	71.34	11.35	113.08	123.74	9.42	126.62
Himachal Pradesh	20.69	20.89	0.99	78.32	85.03	8.58	110.61	118.43	7.08	117.03
Madhya Pradesh[c]	16.38	18.53	13.09	58.92	70.61	19.83	106.75	109.49	2.56	111.97
Punjab	6.84	14.66	114.37	66.12	74.49	12.66	115.41	125.57	8.80	126.39
Rajasthan	11.77	14.72	25.10	50.24	64.67	28.72	110.06	112.68	2.39	118.90
Uttar Pradesh[c]	7.95	10.78	35.57	50.38	62.51	24.07	107.70	112.46	4.42	109.86
South	*18.65*	*22.16*	*18.83*	*58.07*	*75.26*	*29.59*	*104.55*	*105.11*	*0.53*	*104.21*
Andhra Pradesh	18.36	18.80	2.38	56.41	68.74	21.87	103.99	104.70	0.69	103.31
Karnataka	19.68	23.24	18.08	65.74	74.12	12.76	105.15	106.44	1.22	105.51
Kerala	17.88	17.86	-0.11	89.06	90.62	1.76	104.43	104.40	-0.03	103.97
Tamil Nadu	18.54	25.23	36.08	69.61	75.99	9.17	104.73	104.69	-0.04	104.16
East	*11.41*	*16.94*	*48.45*	*58.65*	*76.17*	*29.85*	*104.72*	*105.73*	*0.97*	*100.74*
Arunachal Pradesh	20.83	28.92	38.84	62.23	69.49	11.66	105.72	102.00	-3.52	97.84
Assam	11.47	15.11	31.73	73.32	80.24	9.44	104.73	106.05	1.27	101.79
Manipur	42.66	45.64	6.98	58.67	70.01	19.33	102.90	104.04	1.10	99.93
Meghalaya	27.71	32.37	16.79	77.32	83.50	7.99	103.32	103.17	-0.15	103.61
Mizoram	63.33	60.23	-4.89	91.61	95.80	4.58	103.65	103.83	0.18	98.63
Nagaland	20.88	24.94	19.43	79.10	81.42	2.93	104.23	106.51	2.19	103.81
Orissa	12.53	14.32	14.25	61.18	72.87	19.11	105.34	107.12	1.70	104.90
Sikkim	29.45	30.94	5.08	74.94	79.16	5.63	106.79	108.50	1.60	101.80
Tripura	13.46	16.66	23.81	76.93	85.03	10.54	104.29	105.46	1.12	104.14
West Bengal	9.01	15.75	74.89	68.25	75.74	10.97	104.68	105.51	0.79	99.27

(*continued*)

Table 1 (Continued)

	Women's employment[a]			*Women's literacy*[b]			*Child sex ratios (M/F)*			*Sex ratios at birth*
	1991	*2001*	*% change*	*1991*	*2001*	*% change*	*1991*	*2001*	*% change*	*2001*
West	*15.40*	*16.59*	*7.79*	*58.93*	*77.65*	*31.77*	*108.22*	*112.95*	*4.37*	*116.08*
Goa	21.70	24.33	12.14	73.38	78.98	7.63	104.90	108.24	3.18	111.76
Gujarat	10.97	13.32	21.33	67.70	74.50	10.05	109.96	119.44	8.63	124.61
Maharashtra	17.38	17.99	3.49	70.90	79.09	11.55	107.46	110.12	2.48	112.50

Notes: Data for Jammu and Kashmir are not available for the 1991 census and are hence omitted for comparison difficulties. Data for calculating sex ratios at birth were not published for the 1991 census.

[a] Employment refers to the percentage of women workers in the adult female population above 15 years. [b] Literacy refers to the percentage of literate persons in the population above 6 years. [c] Figures for Bihar, Madhya Pradesh, and Uttar Pradesh include Jharkhand, Chhattisgarh, and Uttaranchal, respectively, for comparability purposes.

Source: Calculated from data provided by the Census of India (Registrar General and Census Commissioner, India [1991, 2001]).

sphere. However, the data on CSRs do not sustain these encouraging findings. The overall Indian CSR of 107.8 in 2001 reflects the average of a much higher urban (110.3) compared to rural (107) figure (Registrar General and Census Commissioner, India 2001), and the sharp rise in urban CSRs (from 106.9 in 1991) indicates persistent and increasing relative survival disadvantage of girls in urban areas.

Many of the recent discussions on the relative survival disadvantage of girls focus on the issue of sex selective abortion of female fetuses. As in East and Southeast Asian countries like China, Vietnam, South Korea, and Taiwan (Elisabeth J. Croll 2002), economic prosperity in India has allowed parents to avail themselves of prenatal sex detection and subsequent abortion of female fetuses in order to obtain desired family compositions. Declared illegal by the Pre-Conception and Pre-Natal Diagnostics Techniques (Prohibition of Sex Selection) Act of 1994 and its amendment the Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act of 2002, the practice of sex selection in India is surreptitious, and direct comprehensive evidence is almost impossible to obtain. However, in contrast with average SRBs between 103 and 106 in developing countries (Waldron 1998), according to the 2001 census, 110 male children were born per 100 female children in urban India (Registrar General and Census Commissioner, India 2001), providing indirect evidence of the use of sex selection.[2] These high SRBs suggest, all else remaining equal, progressively fewer girls in urban India even if after-birth discrimination were absent (Monica Das Gupta 1987; Robert D. Retherford and T. K. Roy 2003).

By engaging in a comprehensive study (encompassing the bulk of urban areas in India) that links the survival of girls both at and after birth with the rates of women engaging in paid work and women's education, this paper attempts to investigate some of the issues that continue to make girls less valued in India's urban areas. As research on urban India is relatively less abundant, the discussion below is a starting point for in-depth research specifically in the context of rapidly growing urban centers where gender bias in survival may persist even as girls who are born and survive may be more empowered.

HOW SERIOUS IS DAUGHTER DISADVANTAGE IN URBAN INDIA?

Though some recent studies have suggested a decline of son preference in India (Retherford and Roy 2003), this is not reflected in sex ratios in urban India. Contrary to expectation, daughters seem to be at the largest disadvantage in major Indian cities as opposed to rural areas. Twenty-seven Indian cities with populations above one million had an average CSR of 112, reflecting a 40 percent increase from 107.4 in 1991 (Registrar General

and Census Commissioner, India 1991, 2001). CSRs have increased in every city except Chennai in South India. Data for a larger set of 1,704 towns and cities (including municipal corporations, municipalities, municipal councils, committees, boards, and city municipal councils) corroborate this trend with average CSRs increasing from 107.4 to 111 over the decade, and with CSRs increasing in 73 percent of such urban areas.[3]

Amartya Sen (1990) introduced the term ''missing women'' to refer to girls and women who were expected to, but had not, survived over a period of time. While declining overall sex ratios in recent censuses indicate fewer missing *women*,[4] a large nationwide difference between the actual number of girls below the age of 6 in the 2001 census and the number calculated by using 1991 CSRs shows a large number of missing *girls* in India in the later census. While this method lacks the sophistication of many later attempts to arrive at more exact enumerations of missing girls and women in India and other parts of the world (see for example Sen [1990]; Ansley J. Coale [1991]; and Klasen and Wink [2003]), it facilitates an understanding of the enormity of the problem by showing a gap of 300,000 fewer girls in 2001 over and above already low numbers reflected in the 1991 CSRs.[5] The improvement in sex ratios above the age of 7 possibly reflects lower maternal mortality and improvements in women's overall morbidity rates (Katherine L. Bourne and George M. Walker, Jr. 1991), but it is also clear that these survival advantages have not benefited younger girls.[6] Looking at the regional dimension of the problem, while the largest numbers of girls below the age of 7 were missing from the northern and northwestern states such as Uttar Pradesh, Gujarat, Maharashtra, Delhi, Punjab, and Haryana, all states except the northeastern states of Arunachal Pradesh and Meghalaya and the southern states of Kerala and Tamil Nadu had lower numbers of girls in this age group compared to what would be expected from the 1991 sex ratios. Information on CSRs in Table 1, accordingly, shows the highest ratio of boys and men to girls and women in Punjab, Haryana, Gujarat, Himachal Pradesh, and Delhi in 2001. Uttar Pradesh (including information for Uttaranchal in 2001) and Rajasthan were other northern and northwestern states with high CSRs.

While it is difficult to draw a one-to-one connection between CSRs and SRBs, information from Table 1 shows relatively larger numbers of male infants in many regions with high CSRs in 2001. At least 80 percent of districts in the northern states and in the western states of Gujarat and Maharashtra had SRBs considerably above the global norm of 105 (see Table 1). Lending strong support to the suspected connection between SRBs and selective abortion of female fetuses, these regions also had the highest reported numbers of cases of sex-selective abortion (Kusum 1993; Ruth S. Freed and Stanley A. Freed 1989; Kamla Sarna 2003). So while no Indian state reflects balanced or higher number of female vis-à-vis male children, gender bias in survival is more pronounced in urban areas of the

northern, north western, western, and possibly north central parts of the country (see Table 1). This observation is not surprising, given the historically defined socioeconomic context of the intensity of patriarchal norms and son preference in India.

REVISITING THE CORRELATES OF LOW DAUGHTER-WORTH IN INDIA

Strong son preference in India follows from an interconnected mesh of economic, social, and religious factors that have been extensively discussed in the literature. While I do not attempt a (re)construction of a detailed model of the correlates of gender bias, it is imperative to summarize some relevant existing literature for motivating the empirical model discussed subsequently and also to help identify institutional constraints sustaining gender bias in contemporary India.

The relatively higher economic value of sons stemming from the twin concerns of parental postretirement economic security and dowry payments for daughters' marriages has been discussed as an explanation for son preference in India. Though insurance and pension funds are moderately well established in urban India, the availability and affordability of these arrangements are not yet widespread. Therefore, the traditional role of men as breadwinners may make sons a more desirable ''investment'' with regard to parental economic concerns regarding the future. A gamut of theoretical and empirical findings substantiates the inverse relationship between women's paid work participation and gender bias (Miller 1981; Alaka Malwade Basu 1992; Judith Heyer 1992). The issue of women's employment in India is a complex one. Women's participation in salaried work outside the household was traditionally looked down upon (see for example Pamela McVay [2008]). Though women have persistently been entering the workforce since the nineteenth century, women's paid work participation in urban India remains relatively low (Table 1) and is a socioculturally influenced decision even in the most modernized areas of the country. Further, even when women are employed, social norms may limit the extent to which married women may economically support their parents. Patriarchal customs such as patrilocality, which requires women to live with or near their husbands' families, may thus translate to a physical and emotional separation from daughters at marriage and reduce the latter's desirability to parents (Kishor 1993).

Furthermore, norms of dowry and disproportionately high marriage expenses to be borne by the bride's family imply drainage of family resources on account of daughters. Referred to in historical texts as *stridhana* (wealth such as the jewelry and gifts given to the bride, which essentially belonged to her and over which she had complete control), some explanations of dowry posit it as compensation for lack of women's

earning capacity. However, instead of waning with modernization and rising women's employment, contemporary reports indicate the metamorphosis of dowry into a compulsory coercive payment (better described as ''groomprice''; Siwan Anderson 2007), extracted from the bride's parents in a variety of monetary and nonmonetary forms. The duration, intensity, and forceful nature of dowry are surprisingly not important factors in reducing the desirability of daughters.

These arguments of girls' low economic worth might imply greater vulnerability of daughters in families with tighter resource constraints and fewer social security options. However, though some studies have been inconclusive (Miller 1981), most empirical studies confirm a positive association between gender bias in survival of girls and household prosperity (Das Gupta 1987; Murthi, Guio, and Drèze 1995). The economic value of women may be higher in low-income families where women are compelled to engage in paid work. In contrast, women belonging to upper- and middle-class Indian families who are free from paid work compulsions often withdraw from the workforce after marriage (David G. Mandelbaum 1970; Ursula Sharma 1980). The positive association between family status and the ability to make dowry payments also implies larger marriage-related expenses for upper- and middle-class women relative to poorer women (Mysore Narasimhachar Srinivas 1989).

The role of religious customs is closely associated with social norms regarding paid work and dowry. Hindus and Muslims, comprising 75.6 and 17.2 percent of the urban population, respectively, are the major religious groups in India (Registrar General and Census Commissioner, India 2001). While restrictive norms toward women in several Islamic countries may be suggestive of strong patriarchy, there is reason to associate the roots of son preference in India with Hinduism, the religion that came to dominate India since the Aryan invasions of 1500 BCE. Hindu women, particularly those of higher castes, were traditionally secluded from public life and participation in economic activity. Largely uneducated and excluded from property inheritance, women of higher castes and classes depended on their ability to bear sons for social recognition. These sons would inherit property and propagate the lineage (McVay 2008). Sons continue to remain important for performing sacred Hindu rituals including ancestral rites in modern India (Srinivas 1989). While postcolonial laws such as the 1956 Hindu Succession Act and its amendments have expanded women's property rights, in practice, women continue to be largely excluded from inheritance (Bina Agarwal 1994). The economic disenfranchisement of women through denial or restriction of both the right to property and paid work participation is strongest in areas of the Hindu heartland of the country (Agnihotri 2000). This possibly underlies the high CSRs and SRBs in the Hindu dominated states of northern and western India. These are also areas with large gaps in SRBs of infants born to Hindu vis-à-vis Muslim

women (data available from author). The state of Punjab, with its large Sikh population, is an exception, with extremely high SRBs among Sikhs (as well as Hindus).[7]

The Constitution of India recognizes Scheduled Castes (SCs) and Scheduled Tribes (STs) as the most disadvantaged groups in India (J. V. Meenakshi, Ranjan Ray, and Souvik Gupta 2000). SCs are at the lowest rung of the Hindu caste pyramid, while STs are tribal groups mostly outside the folds of Hinduism or any other major Indian religion. SC communities are often compelled by poverty to encourage women's employment and abandon marriage-related expenses. ST communities, on the other hand, have their own social structures, some being matriarchal and matrilineal (Srinivas 1989; Agarwal 1994), and thus have been known to be more egalitarian. While gender bias has been found to be historically low among both SC and ST communities (Miller 1981; Kishor 1993), more recent data are unable to confirm low gender bias among SC communities (Murthi, Guio, and Drèze 1995; Agnihotri 2000).

Education has been the most frequently proposed instrument for empowering Indian women (Helen Ware 1984; Bourne and Walker 1991; Murthi, Guio, and Drèze 1995). In particular, the literature suggests four distinct ways through which maternal education could be conducive to the survival of more girls. First, by making women more informed and aware about childcare, health, hygiene, and nutrition, education may lead to better decision making regarding child well-being. Second, by providing skills for paid work participation, education could increase parental incomes and reduce future dependence on offspring, thus leading to less dependence on sons. Further, raising women's paid work participation would also add to the self-worth of mothers, who may now have greater decision-making power to allocate resources toward girls (Sharma 1980). Finally, women with access to income may choose to bear and rear more girls (Alaka Malwade Basu and Kaushik Basu 1991; Agarwal 1994). It is plausible to assume that these beneficial influences of education would be amplified in urban areas through greater media exposure and availability of educational facilities (P. N. Mari Bhat and A. J. Francis Zavier 2003).

Most of these correlates affecting the relative survival of girls have been studied for regional pockets, for the country as a whole, or for rural India alone. This paper studies them in the urban context to investigate whether factors relevant at the regional or national level or for rural India remain important for explaining gender bias or the absence of it in urban areas.

EMPIRICAL MODELS ANALYZING GIRLS' SURVIVAL DISADVANTAGE IN URBAN INDIA

The 2001 census of India, for which we have complete results (Registrar General and Census Commissioner, India 2001), provides information on

twenty-nine states and six union territories. While a state-level study may yield some interesting conclusions (see Klasen and Wink [2003]), some states are larger in terms of area and population and may hide heterogeneities within them. Therefore, this paper employs a cross-sectional regression based study at the district level with regional dummies, which lends itself to examining broad regional patterns as well as establishing a more disaggregated study within regions.

Analysis of district level CSRs in the 1990s

Research on women's survival disadvantage in India has often focused on a North–South dichotomy in the treatment of women, reflected in regionally contrasting sex ratios (Miller 1981). Many of the factors associated with gender bias in India discussed previously are indeed more intense in areas of the north relative to the south. Women in southern India, for example, often retain close postmarital connections with natal kin and, unlike dowry, which implies flow of resources from the bride to the groom's family at marriage, customs of bride price, implying the opposite direction of resource flow with greater bargaining power for the bride's family, have been noted among several communities (Srinivas 1989). Women's employment and literacy rates are also higher in the south (Table 1), and laws and customs often support women's property inheritance. However, focusing on this North–South contrast excludes from its purview analysis of the treatment of women in other parts of the country. Though preliminary analysis shows that gender bias could be stronger in urban areas of northern India, no Indian state had CSRs favoring female children in 2001. Further, the increases in both women's paid work participation and literacy rates in northern states suggest that women's status has improved in these regions. So by relying on regional dummies to capture the relatively higher unquantifiable gender biases in northern India, I consider the urban areas of the country as a whole.

I begin the empirical analysis by analyzing CSRs in the urban areas of 430 districts of the country from the 1991 and the 2001 Indian censuses.[8] Paid work participation rates of women (over the age of 15) and women's literacy rates are two indices of achievement.[9] A lower total fertility rate (TFR) also reflects empowerment to the extent that it captures the scope for engagement in extrahousehold activities and also may reflect the extent to which women control their reproductive lives.[10] Men's labor market participation rates and men's literacy rates indicate overall availability of opportunities in a district. Given that men are regarded as the traditional breadwinners, higher percentages of men involved in paid employment signal work availability. Also, given that priority would be given to educating men, I expect the men's literacy variable to capture the availability of learning opportunities in a district. Further, men's literacy rates could also

serve as a proxy for the overall level of progressive attitudes in a region. I also include the percentage of urban population to indicate the relative extent of urbanization within the district. I summarize the cultural compositions of districts with the percentages of SCs, Hindus, and Muslims.[11] Additionally, I include three dummy variables for the South, West, and East to capture unobserved regional influences. I study associations between CSRs and this set of explanatory variables with separate ordinary least square (OLS) regressions for each year and a pooled model including a time dummy variable to capture the temporal effects on CSRs.

Table 2 presents the results of the OLS regression of CSRs on the list of explanatory variables described above. Lower rates of women's employment are associated with high CSRs across districts. This result is consistent across time and conforms to past research. However, notwithstanding the positive channels through which women's literacy could benefit the survival of more girls, high women's literacy is not associated with low CSRs. The expected negative relationship is statistically insignificant for 1991 and becomes positive and highly statistically significant both for 2001 as well as the pooled model. This result contrasts with earlier analyses and with my expectations about the role of women's education in reducing gender bias in survival. The results also show ''intensification'' of gender bias with declining fertility rates, with higher CSRs across districts being associated with low fertility rates in the 2001 census (Monica Das Gupta and P. N. Mari Bhat 1997). This may indicate the use of selective abortion by parents motivated by twin concerns of son preference and the opportunity cost of larger families. I shall reserve comment on this until the following section analyzing SRBs. These results, which associate higher CSRs with low fertility and high women's literacy, seem to suggest counterintuitive implications regarding relative survival of girls and the empowerment of women in urban India.

Men's paid work participation rates are statistically significantly associated with higher CSRs. If greater men's paid work participation rates suggest greater opportunities, as hypothesized, then this relationship could indicate greater relative disadvantage of women in areas where men's employment opportunities are more abundant. It is possible that this relationship captures the directly unmeasured impact of regional prosperity, which I shall revisit later. This association as in the case of women's paid work is robust across time and also in the case of the pooled model. Men's literacy rates are associated with lower CSRs in 2001 as well as the pooled model. Though higher CSRs were statistically significantly associated with districts with relatively larger percentages of urban population in 1991, relative size of the urban area in terms of population becomes insignificant both in the pooled as well as the 2001 model. This result may be indicative of a temporal spread of gender discrimination not necessarily restricted to

Table 2 Ordinary least square regression of child sex ratios (CSRs) for 430 districts in urban India, 1991 and 2001

Variables	*CSR 1991*	*CSR 2001*	*CSR pooled*
Total fertility rate	–0.04	–1.08*	–0.06
	(0.07)	(0.64)	(0.09)
Women's paid work participation rate	–0.08***	–0.13***	–0.08***
	(0.02)	(0.04)	(0.02)
Women's literacy rate	–0.02	0.20***	0.11***
	(0.03)	(0.06)	(0.03)
Men's literacy rate	0.03	–0.26***	–0.14***
	(0.05)	(0.09)	(0.05)
Men's paid work participation rate	0.10***	0.33***	0.13***
	(0.02)	(0.06)	(0.02)
Percent urban	0.02**	0.00	0.01
	(0.01)	(0.01)	(0.01)
Percent SC	0.17***	0.25***	0.21***
	(0.03)	(0.05)	(0.03)
Percent Hindu	–0.05***	–0.07***	–0.04***
	(0.01)	(0.02)	(0.01)
Percent Muslim	–0.10***	–0.20***	–0.14***
	(0.02)	(0.03)	(0.02)
Time 1991			–3.54***
			(0.33)
Dummy for South	–2.55***	–8.55***	–5.19***
	(0.48)	(0.79)	(0.46)
Dummy for East	–3.42***	–8.46***	–5.89***
	(0.48)	(0.72)	(0.45)
Dummy for West	0.32	0.58	0.86*
	(0.53)	(0.84)	(0.51)
Constant	102.91**	107.95***	111.82***
	(3.11)	(6.45)	(3.35)

Notes: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses. Women's and men's paid work are computed as a percentage of the adult (above 15 years) population. Literacy rates (as per conventional calculations) are calculated above the age of 6. The dummy for the northern states is the reference category.

Source: Calculated from data provided by the Census of lndia (Registrar General and Census Commissioner, India [1991, 2001]).

more populated areas, a result also indicated by the provisional data from the 2011 Census of India. Table 2 further shows districts with higher percentages of SCs to have had significantly higher CSRs. This could be indicative of prosperity-induced adoption of upper caste gender norms among SCs, a point I revisit in the conclusion. None of the religious groups are associated with high CSRs, though the statistically (and economically) larger Hindu vis-à-vis Muslim coefficient in each model suggests relative greater gender bias in the former community. The size and directions of the regional dummy variables suggest that gender discrimination is highest in the western region and lower in the South and East (relative to the

North). The significance and size of the time dummy coefficient captures the worsening of CSRs across districts during the decade.

Analyzing the story of SRBs in urban India

Table 1 shows the distinct correlation between SRBs and CSRs (0.87) across the urban areas of the country. While the lack of temporal data on SRBs does not allow us to comment on the extent to which these *accounted* for the increase in CSRs between the two censuses, there is little doubt that high SRBs increase the relative survival disadvantage of girls. All things being equal, the birth of relatively higher numbers of boys across the globe is a reflection of the relatively higher sex ratio at conception,[12] and a greater men's mortality at every cohort after birth is reflected in relatively fewer males with an increase in age (Waldron 1998). Observed SRBs are therefore the product of biological and health-related factors affecting the relative survival rates of male fetuses, and exceptionally low SRBs could result on account of greater loss of male fetuses (see, for example, Dhairiyarayar Jayaraj and Sreenivasan Subramanian [2004]). Interventions in the nature of prenatal sex selective abortions could, on the other hand, result in high SRBs by influencing the number of girls born. A total of 397 districts in urban areas consistent with those studied in the previous discussion on CSRs had SRBs exceeding the global average of 105.[13] While it is hard to establish a one-to-one association between SRBs and the use of sex selection (given the lack of data), and while district level information does not reflect individual and household level decisions in each district, it is reasonable to assume sex-selective abortions to be more prevalent in these 397 districts than the others. Since my analysis of SRBs is motivated by a desire to understand the correlates of sex-selective abortion, I restricted the following district level analysis of SRBs to data from these districts. Figure 1, showing SRBs by educational achievements, shows a distinct increase in SRBs with educational levels. Admittedly, risks of higher male fetus mortality may be higher for illiterate women (Jayaraj and Subramanian 2004), but the birth of more than seventy (per hundred) more boys to literate vis-à-vis illiterate women in urban areas in 41 percent of Indian states possibly points to the greater use of sex selection by literate women. The contradictions between the suggested empowering effects of women's education and the inverse association found in Table 2 are a prime focus in the analysis of SRBs in the remaining part of this paper.

Table 3 presents the results obtained by OLS regression of SRBs across 397 districts of urban India by considering two different models. Model 1 uses an identical set of explanatory variables as Table 2. Since literacy is broadly defined by the Census of India (Registrar General and Census Commissioner, India 1991, 2001), a literate person may be without any formal level of schooling. Given the greater knowledge and earning power

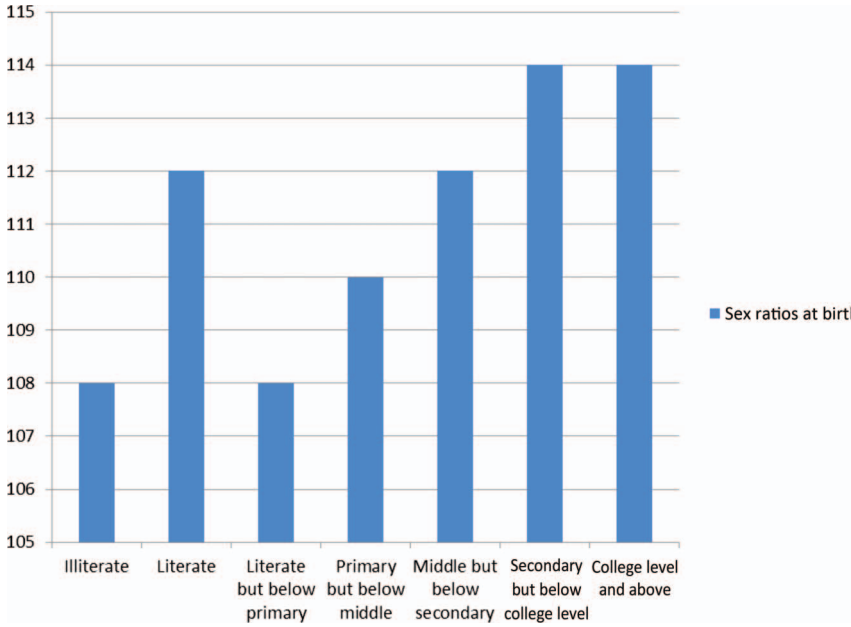

Figure 1 Sex ratios at birth in urban India, 2001
Source: Calculated from data provided by the Census of lndia (Registrar General and Census Commissioner, India [2001]).

associated with formal schooling, the effect of formal education on gender bias could be more distinct. Model 2 attempts to capture the association of different levels of women's education with SRBs by considering as explanatory variables the proportion of literate girls and women according to different levels of education. The proportion of literate girls and women with no formal level of education (as a percentage of the population 7 years and above), with education below the primary level (as a percentage of the population 7 years and above), with education up to the primary level (as a percentage of the population 9 years and above), with education up to the middle school level (as a percentage of the population 12 years and above), with education above middle school but below college level (as a percentage of the population 15 years and above), and with education up to college level and beyond (as a percentage of the population 20 years and above) are the different categories I have considered.[14]

As expected, women's paid work participation rates have a statistically significant negative association with SRBs in both models. Thus, even among districts where SRBs are above the worldwide average of 105, they are *relatively* lower in districts with higher women's employment. The

Table 3 Ordinary least square regressions of sex ratios at birth for 397 districts in urban India, 2001

Variable	*SRB above 105 (Model 1)*	*SRB above 105 (Model 2)*
Total fertility rate	4.25***	4.65***
	(1.00)	
Women's paid work participation rate	-0.30***	-0.26***
	(0.06)	(0.06)
Women's literacy rate (above age 6)	0.33***	
	(0.10)	
Literate women with no formal education		0.10
		(0.29)
Literate women with formal education Below primary school level		0.05
		(0.17)
Up to primary school level		0.11
		(0.20)
Up to middle school level		-0.25
		(0.17)
Above middle school but below college level[a]		0.28**
		(0.13)
College level and above		0.22**
		(0.11)
Men's literacy rate (Above age 6)	-0.33***	-0.01
	(0.10)	(0.01)
Men's paid work participation rate	0.11**	0.11*
	(0.05)	(0.06)
Percent urban	0.00	0.00
	(0.02)	(0.02)
Percent SC	0.24***	0.23***
	(0.08)	(0.08)
Percent Hindu	-0.04	-0.06**
	(0.03)	(0.03)
Percent Muslim	-0.25***	-0.23***
	(0.04)	(0.05)
Constant	112.48***	101.42***
	(5.92)	(10.02)

Notes: ***, ** and * denote 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses. Women's and men's paid work are computed as a percentage of the adult (above 15 years) population. The percentage of women with no literacy is the omitted category.

[a] Refers to the sum of the categories of secondary education and higher secondary education.

Source: Calculated from data provided by the Census of lndia (Registrar General and Census Commissioner, India [1991, 2001]).

associations with men's paid work, men's literacy, and religious and cultural variables are also consistent with Table 2. Women's literacy continues to have a strong positive association with SRBs across the 397 districts that had higher than ''normal'' SRBs. Model 2 shows this positive relationship is sustained for all levels of women's education. The size and significance of the coefficients in the categories of education above middle school level in

fact imply that districts with large percentages of highly educated girls and women (above the middle school level and college level) are also the ones with the highest SRBs. Since my analysis focuses on districts where SRBs are already higher than average, the regression results seem to indicate increasing use of sex-selective abortions by women educated above the middle-school level in such districts.

These results are not entirely surprising and concur with regional studies showing greater prevalence of sex-selective abortions among relatively higher-educated women (Das Gupta 1987; Beverly E. Booth and Manorama Verma 1992; S. Sudha and S. Irudaya Rajan 1999; Partha Dasgupta 2010). However, the results disagree with broader national studies based on earlier censuses that suggest women's education is associated with reduced survival disadvantage for girls (Bourne and Walker 1991; Murthi, Guio, and Drèze 1995). Notably, most studies do not exclusively focus on urban areas, and my results therefore point to the need for more such targeted studies.

A study of growth rates of the numbers of literate women in different educational categories across urban areas of states from the 1991 and the 2001 censuses shows the largest growth to have been among women with education above the middle-school level followed by those with education beyond the college level (data available from the author). The growth in the number of women educated beyond college level was comparatively higher in the southern and northeastern regions relative to the more gender-biased northern, western, and northwestern states. However, given the large growth in the percentage of women educated beyond middle school in some of the northern states, one could expect to find large numbers of college-educated women in these areas in the next census. While it would be counterintuitive to suppose that an increase in percentages of college-educated women could aggravate rather than reduce gender bias, results from Table 3 certainly seem to predict that outcome. It would be a strange, if not ridiculous, proposition to stop at this stage with a policy prescription of *not* increasing higher education for women in urban India. However, it appears that the channels through which education is thought to be associated with empowerment do not seem to be operative, at least at relatively higher levels of education, and it is worth trying to analyze the explanations. Given the limited evidence in the context of urban India, much of the following discussion draws upon research at the level of India as a whole or rural India and thus tries to construct the argument for similar research in the context of urban India.

HIGHER EDUCATION AND ITS IMPLICATIONS FOR GENDER BIAS IN URBAN INDIA

One way in which women's education is professed to reduce gender bias in survival is by facilitating more employment and thus raising the economic

value of daughters. While, all things being equal, women's survival disadvantage is indeed inversely related to women's paid employment, and notwithstanding the hypothesized association between women's education and employment, there was actually a slightly higher percentage of illiterate women (of the population of illiterate women) in the workforce in 2001 (Table 4). Moreover, contrary to the sharp increases in the percentages of women receiving higher education throughout the country, the percentage of literate women who were employed actually decreased between the 1991 and 2001 censuses. Most striking is the relatively low paid work participation of women educated above the college level. Though there was a slight increase in the paid work participation of such women, more than three-quarters of them were absent from the paid work force in the 2001 census. Even when one considers women with technical degrees and professional training, less than half of such women figure in the workforce on average. Notably, northeastern states with lower gender bias had a relatively large percentage of highly educated and technically trained women in the workforce, and the paid work participation of literate women was lower in the northern states with the sharpest gender bias (detailed data available from author on request). All of this suggests that even if women's employment is associated with reduced women's survival disadvantage, higher education may not necessarily be associated with paid work participation. This naturally warrants an enquiry into the purpose of obtaining higher education, if it were not for obtaining paid employment.

Women's literacy rates were below 1 percent in most provinces of British India, and most upper and middle-class women did not receive anything beyond the most rudimentary education until the nineteenth century

Table 4 Women's paid work participation and fertility rates for urban India, 1991 and 2001

	Women paid workers		*Fertility rate*	
Educational category	*1991*	*2001*	*1991*	*2001*
Illiterate	9.57	12.88	2.48	2.49
Literate	16.29	11.3	1.95	1.93
Literate but below secondary school level	5.64	8.19	1.67	1.74
Secondary schooling and above but no college degree	9.68	9.75	1.48	1.41
College degree and above other than technical degree or equivalent	24.11	24.86		
Technical degree or equivalent	55.42	48.92		
College degree and above (required for fertility rates)			1.27	1.24

Source: Calculated from data provided by the Census of lndia (Registrar General and Census Commissioner, India [1991, 2001]).

(McVay 2008). Efforts to educate women have been zealous in postcolonial India, and progress is evident from Table 1. However, the historical focus of educating women, from the European missionaries and Indian social reformers to post-Independence efforts, was not to empower them to challenge social roles but rather to make them better conformists to traditional roles (Vanaja Dhruvarajan 1990; Swarna Jayaweera 1997). Even in 1975, India's National Council of Educational Research and Training felt that ''the boys have to be prepared for the world of work outside the home [and] the girls will have to be prepared particularly for the work inside'' (A. R. Kamat 1976: 14). This narrow gendered perspective of education has often meant better schooling for men who are seen as breadwinners, and women obtaining higher education while ''waiting'' to be married (Kamat 1976; Srinivas 1989). Education has thus served to reinforce gender stereotypes rather than allowing for more opportunities for women. The puzzling disconnect between women's education and employment may not be so surprising in light of this history.

Unlike the contingent nature of women's employment, marriage continues to be a central requirement of Indian society, and the ability to arrange appropriate marital alliances for daughters is an important vehicle for preserving and raising of Indian family status. While the discussion of marriage payments and dowry may seem to contribute little to understanding the connection between women's higher education and girls' survival disadvantage, a deeper analysis makes the link obvious. Lack of comprehensive data on per capita income precludes comment directly corroborating the connection between higher education and prosperity. However, circumstantial evidence suggests that given the combined expenditure on tuition, supplies, and the opportunity cost of time, higher education can be considered somewhat of a luxury in urban India and its association with women's greater survival disadvantage may be reflective of gender bias among the prosperous. Given a tradition of hypergamy, wherein middle- and upper-class parents strive to marry daughters off to grooms higher in the social hierarchy, the role of education is often seen as an accessory signaling eligibility in the marriage market, since educated grooms require educated brides (Kamat 1976; Srinivas 1989). Ironically, relatively well-off parents of these educated daughters may be required to pay relatively *higher* dowry to secure alliances with coveted matches (Madhu Kishwar 1986; John van Willigen and V. C. Channa 1991). The pressure of dowry may sometimes be lower with women's earning power (Madan C. Paul 1986), but educated women, in many cases, may not be participating in paid work outside the household.

Contrary to common beliefs about dowry being an archaic institution, studies have amply shown that though regulated by kinship and other social networks in rural areas, the anonymity and isolation in urban scenarios provides a greater scope for dowry extraction (van Willigen and Channa

1991). The Dowry Prohibition Act (1961, amended in 1984 and 1986) has remained largely ineffective, and dowry flourishes among the educated middle and upper classes and among nontraditional communities in India's urban centers (Kishwar 1986; Heyer 1992; Anderson 2007). The illegal nature of dowry makes it difficult to obtain empirical evidence, but to the extent that dowry pressures represent a powerful factor reducing the desirability of girls, it is relevant to look into some available data. The crime department of the Indian government publishes data on deaths attributable to dowry (Government of India 2008). While all cases of dowry may not be reported and all dowry demands may not lead to death, calculations show a 75 percent increase in such deaths between 1995 and 2008, with the Indian capital city New Delhi accounting for the largest percentage of such cases. Cases of dowry-related violence remain rampant throughout Indian cities, particularly so in northern and western India, and rising monetary demands in tandem with growing economic opportunities reaped mostly by men continue to pressure parents of brides.

Gender bias in the childbirth and survival of girls in prosperous households with educated daughters and brides may be facilitated via at least two channels. First, by providing the means (monetary resources) and motivation (via the pressure of dowry payments, for example), prosperity may enable women to use sex selection to obtain sons while simultaneously controlling fertility (Das Gupta 1987; Bhat and Zavier 2003). All things being equal, Table 4 therefore indicates a sharper rise in SRBs as educational achievements increase and fertility rates keep falling. Second, prosperity could also result in relatively higher SRBs and CSRs by aiding the survival of boys. Maternal education could lower the vulnerability of boys (Peter Mayer 1999), while literacy may *enable* mothers to neglect undesired daughters to a greater extent by denying them equal access to care (Das Gupta 1987). The extensive literature on neglect of girls elaborates on unequal access to food (Pranab K. Bardhan 1974; Barbara Harriss 1991) and healthcare (Booth and Verma 1992; Abay Asfaw, Francesca Lamanna, and Stephan Klasen 2010). Though many of these studies focus on India as a whole or on rural India alone, the few studies based exclusively on urban India do not show declining neglect with greater availability of resources in urban areas (for example, see Booth and Verma [1992]).

All of this suggests that women's education in urban India largely continues to be a status marker and might be correlated with greater dowry payments on the one hand and greater ability to discriminate against girls by using sex selection. If empowerment is considered to be the ability of individuals who had been long denied choices to be able to make choices for themselves (Naila Kabeer 1999), then higher education may not be empowering in the absence of conferring self-worth to women. Women, though educated themselves, may lack the agency to question the predominant cultural framework (Amartya Sen and Jean Drèze 2002).

And, the desire to bear sons may be intricately connected with women's power and position within the household (Sharma 1980; Heyer 1992). Needless to say, these preferences may be more pronounced in the absence of higher self-worth through economic participation outside the household.

State-level population policy in India has focused on the twin goals of rewarding fertility control and providing positive incentives (mostly monetary) for bearing and rearing girls. The Girl Child Protection Scheme in Tamil Nadu (Asha Krishnakumar 2005), or the Ladli Scheme in Delhi (*The Hindu* 2008) are two examples. Such incentives may be effective in reducing gender biases among the poor. However, traditional biases favoring sons are extremely resilient, and economic incentives may not be sufficient to improve the survival of girls when discrimination is propagated in economically prosperous households. In contrast to education and paid work, which are relatively easily manipulated by state support, eliminating discriminatory attitudes can pose the most challenging threat to the birth and survival of girls. The positive role of education operates within a wider canvas of social settings, and cultural influences may be more powerful in determining the extent of son preference than actual levels of education (Basu 1992). The strongly statistically significant regional dummy variables are a case in point.

Sex selection by parents reflects an accumulation of historical biases, and laws to ban it may remain as ineffective as the laws favoring women's property inheritance or banning dowry (analogous to the less successful laws favoring widow remarriage or those banning infanticide of girls in British India), as long as the deep-rooted patriarchal origins of institutions remain unchanged. It is the sociocultural context that still values the domestic and dependent roles of women, the parental responsibility to get daughters well married, the lack of resource flow between women and their natal families, and men's ownership of family property that is the source of high survival disadvantage for girls and women. Until those attitudes change, sons will be preferred in urban India, and cases of sex selection will continue to be unreported.

These predictions run counter to earlier and recent research that implies a turnaround in the survival disadvantage of girls in India in the near future (Klasen and Wink 2003; Stephan Klasen 2008; Monica Das Gupta, Woojin Chung, and Li Shuzhuo 2009). The sharp increases in the CSRs in the 2001 census have been posited to be the direct result of greater availability of sex-selection technology in the decade of the 1990s, leading to more births of boys even as son preference may have been declining. However, it is not entirely clear whether the masculine CSRs and SRBs in the 2001 census indeed indicate a one-time technological shift. Sex-selection technologies such as amniocentesis have been available in India since 1975, and research suggests increasing growth of clinics and practice of sex selection in the

decade of the 1980s (Anjali Gupta 1987). The complete results from the 2011 census are not yet available. However, if the provisional census results and other reports (see for example ActionAid [2008]) published since the release of the 2001 census data are indicative, one could expect to find increasing incidence of selective abortion reflected in higher SRBs. This study has shown the issue of women's relative survival disadvantage in India is complex and continues to be determined by factors deeply entrenched in the cultural ethos.

CONCLUSION

In contrast to popular beliefs about modernization working to dilute patriarchal influences, feminist and economic development research has amply shown a negative relationship between women's statuses and the level of development (Ester Boserup 1970). This study also demonstrates this negative relationship. Women's birth and survival disadvantage remains a stubbornly persistent feature of Indian demography, and girls continue to be absent from successive census counts not only in the traditionally discriminating areas of north and northwestern India, but also in the prosperous urban areas of western India. Though it is hard to comment on the exact association between CSRs and SRBs due to lack of comparable data from the 1991 census, correlation between CSRs and SRBs from the 2001 census suggests that, on average, high SRBs are features of high CSR states and indicate use of sex selection. While the slight declines in CSRs in the most discriminatory northern states in the 2011 provisional data suggest that the relative survival disadvantage of women might now be declining, simultaneous large increases in masculinity of CSRs in some of the northeastern states, which have been traditionally less discriminatory toward women, implies the need to direct sharper focus on the problem. The purpose of this paper is to draw attention to the fact that gender bias, commonly perceived as a feature of underdeveloped economies, exists in the rapidly growing urban centers of India and may intensify in the years to come especially in the eve of rapid urbanization.

My empirical results indicate that there may be little incentive for the rich to prefer daughters – who may not be participating in the workforce, who nonetheless need to be educated for securing good marriage matches, who need to be married off at a high cost, and who would not inherit family property and maintain lineage. Recent research in the context of South Korea shows urbanization and the associated improvements in women's education and paid work participation to have reduced prenatal gender bias, leading to similar predictions for India (Woojin Chung and Monica Das Gupta 2007). Though the connection between girls' worth and paid work and survival is reconfirmed in this study, data suggest that a relatively large percentage of women, even when educated up to and beyond college

level, do not participate in the workforce, and many women workers are illiterate. Scarcity of jobs for highly educated women could be part of the issue, but traditional biases regarding the outside paid work participation of women could also be a deterrent. Thus, along with increasing educational opportunities for women and ensuring the availability of employment options for them, influencing the sociocultural biases that restrict them from the workforce is important for increasing the survival of girls. It is possible as more and more women receive college education, educational achievements could translate into higher paid work participation rates for more women, reducing gender bias. But, a substantial contribution of this research is to conclude that there will be persistence (if not intensification) of gender bias in future years, at least in the short term.

While this study has primarily focused on studying the associations between higher education, prosperity, and gender bias, there are additional interesting issues in the regression analysis that might be important in context. The effect of religious biases in affecting discrimination is not entirely evident from Tables 2 and 3, though the size and significance of the Hindu coefficient does indicate relative greater discrimination in areas with larger percentages of Hindus. Further disaggregated analysis within regions could point to more distinct effects. The statistically significant positive association between the percentage of SC population and both SRBs and CSRs implies that, notwithstanding past research, girls are disadvantaged in this community. The close link between class and caste may increasingly be becoming blurred in urban India, and as lower castes become prosperous, they might be emulating upper caste norms such as women's seclusion, dowry payments, and withdrawal from paid work (Gerald D. Berreman 1993), a process described as *sanskritization* by Srinivas (1989). While Agnihotri (2000) notes lower women's paid work participation rates among SCs in 1981 in some areas, no comprehensive and relevant study exists for urban India, and these results need to be explored further.

This study of women's survival disadvantage in urban India is an investigation into a phenomenon that is complex and regionally diverse. Improving the birth and survival rate of girls requires an interdisciplinary emphasis and does not lend itself to easy policy recommendations. In future years, greater education and a higher standard of living would imply better maternal care and health, ensuring the survival of more male fetuses. Increasing prosperity and resource availability would also facilitate the affordability of sex-selection technology. Both factors could work to raise SRBs and CSRs. Manifestations of a shortage of women could result in rising numbers of incidents of trading girls and women across regions and a further commodification and devaluation of women (Jean Drèze and Reetika Khera 2000). The association between prosperity and gender bias, while indicating the possible misplaced lack of focus of state policies

targeted at lower income groups, also suggests the failure of only utilizing legislation to reduce gender bias. Changing deeply entrenched gendered perceptions would require concerted efforts by the government and nongovernmental sectors (Das Gupta, Chung, and Shuzhuo 2009).

The difficulty of reaching strong explanations given the paucity of comparable data on a large number of variables, including income, for the vast bulk of urban areas considered for analysis should be borne in mind. Many of the ideas and connections posited in this paper could not be tested at the district level for lack of data on social variables such as dowry or property inheritance norms. While reinforcing the importance of women's paid work participation for increasing the value of women in society, this study also points to the need for detailed attitude studies to facilitate a clearer identification of the women who are actually discriminating against their unborn daughters, including their economic classes and employment statuses. A primary motivation of this research is the generation of hypotheses and identification of key issues that could pave the way for more specific and targeted research on the missing girls in urban India.

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NOTES

[1] Indian censuses define overall sex ratio as the number of females per 1,000 males. This paper, however, uses the more conventional definition of males per 100 females. In this paper, CSRs are defined as the number of male children per 100 female children in the age cohort of 0–6 years, while SRBs are defined as the number of male children per 100 female children at birth.

[2] Data on SRBs were also previously difficult to obtain, leading researchers to rely on indirect estimations (S. Sudha and S. Irudaya Rajan 1999). The 2001 Census of India, by providing information on the number and sex of children born in the year previous to the census, allows for the computation of SRBs for the first time.

[3] There are 1,756 towns listed in the 2001 census. Municipal corporations are the urban local governance bodies for cities with populations above three million. Municipalities, municipal councils, committees, and boards govern smaller towns. After adjustments for comparability, I used data for 1,704 towns for which comparable data are available. Data for some towns were not available for 1991, when towns did not exist or were located in areas, such as the state of Jammu and Kashmir, where the 1991 census was not conducted. Also, the dataset does not include smaller towns variously called census towns, gram panchayats, nagar panchayats, and so on.

[4] The overall sex ratio in urban India declined from 111.88 in 1991 to 111.05 in 2001 (Registrar General and Census Commissioner, India 2001). While comprehensive data from the 2011 census of India is not yet available, provisional data indicate a sustained decline in the total urban sex ratio to 107.9.

[5] National and state-level calculations supporting this have not been presented here and are available on request from the author.

[6] In contrast to a 0.41 percent increase in girls and women over the age of 7 years compared with what was predicted by the sex ratio in 1991, there was a 0.79 percent decrease in the corresponding number of girls 0–6 years in urban India between 1991 and 2001 (Registrar General and Census Commissioner, India 1991, 2001).

[7] It should be mentioned here that Sikhism is the main religion in the state of Punjab, where CSRs are the highest in the country. While 1.78 percent of the urban Indian population is comprised of Sikhs, Sikhs constitute nearly 37 percent of urban Punjab's population. Apart from having its roots in Hinduism, Sikhism is also a religion characterized by a strong sense of male chivalry and patriarchy, possibly reflected in the high CSRs and SRBs in Punjab.

[8] The 2001 census of India provides data for 593 districts. Some districts do not have any urban regions and have been left out from this analysis. Also, additional districts have been carved out of existing districts for the 2001 census, accounting for a greater number of districts in the later census. Data on the new districts have been added together to ensure comparability with the 1991 districts.

[9] Census data on women workers are used to capture women's participation in gainful economic activity. This study uses the 2001 census definition of work as ''any economically productive activity with or without compensation, wages or profit, which is physical or mental in nature. This also includes the supervision or the direction of work'' (Registrar General and Census Commissioner, India 2001). Frequent changes in the definition of work have made longitudinal studies based on census data difficult. However, definitions of work did not change noticeably between 1991 and 2001, allowing the comparable use of the census data on workers across these years. Further, the narrowness of the definition of work used by the census of India and the consequent under emuneration of women workers engaged in ''invisible'' work has also been under criticism. However, there is reason to believe that the census gives a fairly good estimate of women workers engaged in activities that are associated with monetary gain. While measuring invisible women workers is vital for understanding their contribution to the economy, remunerative work is important for guaranteeing a command over resources leading to women's greater worth. Thus urban women's paid work participation rates used in this analysis have been computed using census data. The census of India defines literacy as the ability to read and write any language with understanding (Registrar General and Census Commissioner, India 1991, 2001).

[10] The TFR is the number of children who would be born to an average woman who experiences each of the age-specific fertility rates of a population in a given year as she progresses through her reproductive lifetime. Age-specific current fertility rates for urban women below 49 years of age have been used to compute the TFR.

[11] As noted earlier, behavioral differences between SCs and STs make it unproductive to group them together. Given that the ST population comprises only 2 percent of the urban Indian population and that it is totally absent from some states like Punjab, Haryana, and Delhi, where girls are most disadvantaged, this study only includes the percentage of the SC population.

[12] The biologically established higher sex ratio at conception, or the primary sex ratio, is estimated to be around or above 110 males per 100 females (Sanford Winston 1931). Though greater vulnerability of the male embryo and fetus results in higher numbers of male stillbirths and spontaneous abortions, more male infants are born relative to

female infants (Alan C. Stevenson and Martin Bobrow 1967; Michael S. Teitelbaum and Nathan Mantel 1971).

[13] The districts of Jammu and Kashmir have been omitted to maintain comparability with the previous analysis. Additional districts have been carved out of existing districts for the 2001 census, accounting for a greater number of districts in the later census. Data on the new districts have been added together to ensure comparability with the 1991 districts in the previous analysis but have been considered separately in the analysis based on the 2001 data alone.

[14] Denominators for the categories of primary and above have been computed on the basis of census data. For example, the census does not provide any data for primary school–level literacy below the age of 9, and so this ratio has been calculated as a percentage of the population above 9 years, and so on. I have considered different age groups for creating variables representing women's education at different levels in order to remove the effect of differing age compositions in the different districts.

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