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Rethinking the Connections between Female Empowerment and Gender Bias in Child

Births and Survival in Urban India

ABSTRACT

Notwithstanding improvements in female work and educational achievements persistent and increasing female survival disadvantage is a feature of urban India's demography. A temporal and cross sectional analysis of most recent available data from the Census of India while reaffirming the positive association between female work and the birth and survival of more female children, fails to reconfirm the oft emphasized positive connection between female education and increased survival of girl children. Relatively high levels of female education, by being indicative of household socioeconomic status may be associated with increased ability to discriminate especially in the presence of cultural biases resulting in low female participation in the labor market, persistence of dowry payments and lack of female property rights. As educational achievements of urban Indian women improve, gender discrimination in birth and survival of female children may therefore intensify as a cumulative effect of socioeconomic factors continuing to favor sons.

1. Introduction

Relative abundance of females in most parts of the world reflects their natural biological survival advantage relative to males (Ingrid Waldron 1993, 1998). However, a combination of “mortality and natality inequality” (Amartya Sen 2001) traditionally operating through differential allocation of childcare and occasional infanticide after birth and more recently through prenatal sex selection before birth has skewed child sex ratios (CSRs) and sex ratios at birth (SRBs) heavily towards male children in some countries of south (India, Pakistan, and Bangladesh), east (People’s Republic of China) and southeast (Vietnam, Taiwan and South Korea) Asia. This survival disadvantage of females during the early years, reflected in relatively fewer surviving adult females in these regions is possibly the starkest form of gender inequality in today’s world. While a historical study of civilizations would possibly reveal few without predominantly patriarchal institutions consequently reflected in a strong preference for male vis-à-vis female off spring (see David Bloom and Gilles Grenier 1983), economic development has often coincided with waning if not disappearing son preference in several parts of the world (Shelley Lundberg 2005). Son preference and relative female survival disadvantage in India continues to be of interest due to its amazing persistence. Much of the gamut of scholarly research focused on studying this issue (see for example Barbara Miller 1981; Sunita Kishor 1993; Mamta Murthi, Anne-Catherine Guio and Jean Dreze 1995; Satish Agnihotri 2000) suggests female empowerment through education and work participation to be important for shifting the balance of parental preferences towards female children. However, most studies of relative female survival disadvantage in India have focused on the country as a whole or exclusively on rural India. Though there have been some

studies focusing on the impact of urbanization on gender bias (Jocelyn Kynch and Amartya Sen 1983; Murthi, Guo and Dreze 1995; Stephan Klasen and Claudia Wink 2003) there has been no study comprehensively focusing on the status of women in urban India possibly on account of two reasons. Urbanization has often been associated with improved female child survival (Nancy Williamson 1973), the positive effects working through superior availability of healthcare and amenities reducing health hazards of all children including females and a supposed modernization of attitudes leading to and from greater female empowerment benefitting female children exclusively. Given increased urbanization in the wake of rapid of economic growth in India, it becomes important to understand whether improving accomplishments of education and work in urban areas do raise the worth of female children and improve their relative survival. This paper engages in this study based on data from the two recent most completely available population Censuses of India (Registrar General 1991& 2001). It is important to mention that the 2011 Census of India has just been completed and provisional data from this Census shows CSRs further tilted towards males. At the time of drafting this paper, detailed rural-urban break up of data or data for SRBs was not available. Hence apart from sporadic references, this paper is not based on the 2011 Census.

INSERT TABLE 1 HERE (half page)

Improvement in female achievements in literacy and work participation rates in urban areas is clearly apparent from Table 1. Though literacy in this context refers to the simple ability to read and write and not necessarily formal education and though work participation does not reflect the nature of such work, these figures do reflect increasing integration of women into the public sphere and growing female achievements. These

encouraging findings are however not sustained by the data on CSRs¹. The overall Indian CSR of 107.8 (according to the 2001 Census) reflects the average of a much higher urban (110.3) compared to the rural (107) figure. The sharp rise in urban CSRs (from 106.9) during the decade thus indicates persistent and increasing relative female child survival disadvantage in these areas.

Much of the recent discussions on relative female survival disadvantage focus on the issue of sex selective abortion of female fetuses. As in east and south east Asian countries like China, Vietnam, South Korea and Taiwan (Elizabeth Croll 2002) economic progress in India has allowed parents to avail of easy methods of detection and selective abortion of female fetuses. Prenatal sex detection techniques such as amniocentesis, chorionic villus suction and biopsy and ultrasonography, originally legalized for medical uses such as detection of congenital fetal abnormalities, have provided parents easy options of obtaining desired family compositions. While these technologies are fast suspected to be penetrating rural areas (Nivedita Menon 1996), one could suspect the availability to be more widespread in urban areas. Declared illegal by the Pre-Conception and Pre-Natal Diagnostics Techniques (Prohibition of Sex Selection) Act of 1994 and its amendment the Prenatal 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 males were born per 100 females in urban India². These high SRBs suggesting the birth of fewer than average female children in urban India are indirect evidence of sex selection (Monica Dasgupta 1987; Robert Retherford and T.K. Roy 2003) and would ceteris

paribus result in progressively fewer female children even if after birth discrimination were absent.

The roots of patriarchy in India are entrenched in a civilization whose norms date back to around 1500 BCE. Observed CSRs and SRBs are a reflection of complex processes which have sustained gender bias even after the passage of several centuries and accomplishments by a number of Indian women. A preliminary glimpse of national level data belies the optimism of reduced gender bias automatically accompanying female empowerment through work and literacy. By engaging in a comprehensive study (encompassing bulk of urban areas in the country) linking female child survival both at and after birth with female work and education this paper attempts to begin investigating some of the issues which continue to make female children less valued in India's urban areas. As mentioned earlier, research on urban India is relatively less abundant. The discussion below is a starting point for in depth research specifically in the context of fast growing urban centers of the country where gender bias in survival may persist even as female children who are born and survive may be more empowered.

2. 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 has not been reflected in relatively higher numbers of surviving female children in urban India. Contrary to all expectations, female children seem to be at the largest disadvantage in major Indian cities. Twenty seven Indian cities with population above a million had an average CSR of 112 according to the 2001 Census with the forty percent increase in this figure from 107.4 in 1991 reflecting an increase in CSRs in all cities except Chennai in south India. Data for a larger set of 1704

towns and cities (including municipal corporations, municipalities, municipal councils, committees, boards and city municipal councils³) corroborates this trend with CSRs increasing from 107.4 to 111 over the decade, becoming more masculine in seventy three percent of such urban areas.

The term “missing women” was used for the first time by Amartya Sen (1990) to refer to females who were expected to but had not survived over a period of time. While declining overall sex ratios⁴ in recent Censuses indicates an improvement in the numbers of missing *women*, a large nation-wide difference between the actual number of females below the age of 6 in the 2001 Census and the number predicted by 1991 CSRs, shows a large number of missing female *children* in India in the later Census. While such a method (of estimating missing female children) is crude and lacks the sophistication of many later attempts to arrive at more exact enumerations of missing females in India and other parts of the world⁵, it facilitates an understanding of the enormity of the problem by showing a gap of 300,000 fewer girls in 2001 over and above the low numbers reflected in the 1991 CSRs⁶. Though lower maternal mortality (Katherine Bourne and George Walker 1991) and morbidity rates are reflected in improved sex ratios in the population above 7 years, younger girls have continued to be missing in large numbers⁷. Looking at the regional dimension, while states in the northern and northwestern parts such as Uttar Pradesh, Gujarat, Maharashtra, Delhi, Punjab and Haryana lost maximum number of girl children below 7 years, all states except the northeastern states of Arunachal Pradesh and Meghalaya and the southern states of Kerala and Tamil Nadu had lower number of girl children in this age group compared to that predicted by the 1991 sex ratios. Information on CSRs in Table 1 accordingly shows the most masculine CSRs in Punjab, Haryana,

Gujarat, Himachal Pradesh and Delhi. Uttar Pradesh (including information for Uttaranchal in 2001) and Rajasthan were other northern and northwestern states with masculine CSRs.

While it is difficult to draw a one for one connection between CSRs and SRBs, information from Table 1 clearly shows relatively larger number of male infants to have been born in many regions of relatively higher female survival disadvantage in 2001. At least eighty percent of districts in states of the northern region and the states of Gujarat and Maharashtra in the west had SRBs considerably above the world average of 105 (see Table 1 in Appendix). Not surprisingly most of these are also the regions reported to have the highest number of cases of sex selection (Kusum 1993; Ruth Freed and Stanley Freed 1998; Sarna Kamala 2003), reaffirming the connection between SRBs and sex selection suggested earlier. So while no state reflects the biologically probable higher number of female relative to male children, gender bias in survival is more pronounced in urban areas of northern, north western, western and possibly north central parts of the country (see Table 1 and Figure 1). This observation is probably not surprising given the historically defined socioeconomic context of the intensity of patriarchal norms and son preference in India. This is the issue we turn to next.

3. Revisiting the Correlates of Low Female Child Worth in India

Strong son preference in India follows from an interconnected mesh of economic, social and religious factors which 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 modern India.

The relative higher economic value of male offspring stemming from the twin concerns of parental post retirement social security and dowry payments for daughter marriages has been discussed as a prime 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 may yet not be widespread and traditional role of males as breadwinners may make male children a more desirable “investment” from parental future economic concerns. Further, apart from these indirect effects, employment may also raise the worth of daughters specifically to mothers by positively influencing female self-worth and decision making power within the household (Ursula Sharma 1980) and women with access to income may choose to bear and rear more girl children (Kaushik Basu and Alaka Basu 1991; Bina Agarwal 1994). A gamut of theoretical and empirical finding substantiates this inverse relationship between female labor market participation gender bias (Miller 1981; Judith Heyer 1992; Alaka Basu 1992).

The issue of female employment in India is a complex one. Female participation in salaried work outside the household was traditionally looked down upon (see for example Pamela McVay 2008) and though women have persistently been entering the labor force in since the 19th century, female work participation in urban India remains relatively low (Table 1) and is a socio-culturally influenced decision even in the most modernized areas of the country. Further, even when 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 their marital families and exogamy,

which implies women are married far away from their natal home may thus translate to a physical and emotional separation from daughters at marriage and reduce the latter's desirability to parents (Kishor 1993).

Apart from this potential lack of income earning or contributing capacity, 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 and which essentially belonged to her and over which she had complete control) some explanations of dowry posit it as compensation for lack of female earning capacity. However, instead of waning with modernization and rising female 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 is not surprisingly an important factor reducing the desirability of female children.

These arguments of low economic worth of girls might imply greater vulnerability of female children 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 girl children and household prosperity (Das Gupta 1987; Murthi, Guio and Dreze 1995). Economic value of women may be higher in low income families where women are compelled to work in contrast to women belonging to upper and middle class Indian families who free of compulsions remain limited to domestic responsibilities often withdrawing from the workforce after marriage (David Mandelbaum 1991; Sharma

1980). Positive association between family status and ability to make dowry payments also implies larger marriage related expenses for these women relative to their poorer counterparts (Mysore Narasimhachar Srinivas 1989).

Closely associated with social norms regarding work and dowry is the role of religious customs. Hindus and Muslims comprising 75.6 percent and 17.2 percent of the urban population are the major religious groups in India. While restrictive norms towards women in several Islamic countries may be suggestive of strong patriarchy, there is reason to associate the roots of son preference in India to Hinduism, the religion which came to dominate India since the Aryan invasions 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, social recognition for women of higher castes and classes depended on their ability to bear male children who would inherit property and propagate the lineage (McVay 2008). Male children continue to remain important for performing sacred Hindu rituals including ancestral rites in modern India (Srinivas 1989). While postcolonial law such as the Hindu Succession Act (1956) and its amendments have expanded women's property rights, in practice women continue to be largely excluded from inheritance (Agarwal 1994). Economic disenfranchisement of women through denial or restriction of both the right to property as well as that of labor market participation is the strongest in areas of "dominant Hindu ethos" (Gerald Berreman 1993 as quoted in Agnihotri (2000)) and 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 not shown here). The state of Punjab, with its large Sikh

population, is an exception, with extremely high SRBs among the Sikhs (as well as Hindus) ⁸.

Scheduled Castes (SCs) are at the lowest rung of the Hindu caste pyramid while Scheduled Tribes (STs) are tribal groups mostly outside the folds of Hinduism or any other major Indian religion. Studies of female status in India often includes these poverty ridden (Meenakshi and Ranjan Ray 2000) social groups to serve the joint purpose of understanding religious and economic influences on gender bias. While, within the Hindu caste system, SC communities are often compelled (by poverty) to encourage female 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 egalitarian. While, gender bias has been found to be historically low among both communities (Miller 1981; Kishor 1993), more recent data is unable to confirm low gender bias among SC communities (Murthi, Guo and Dreze 1995; Agnihotri 2000).

Education has possibly been the most oft suggested instrument for empowerment of Indian women (Helen Ware 1984; Bourne and Walker 1991; Murthi, Guio and Dreze 1995). In particular the literature suggests three distinct ways through which maternal education could be conducive to the survival of more girl children. First, by making women more informed and aware about childcare, health, hygiene and nutrition education may lead to better decision making regarding child wellbeing. Secondly, education by providing skills for labor market participation could reduce future dependence on off spring by increasing parental incomes and make daughters as preferable as sons. By raising the visible work participation of women, this would also

add to the self-worth of mothers who may now have greater decision making power to allocate resources towards girl children. Finally, educated women through a greater exposure to “western” ideas (Bourne and Walker 1991) may not need sons to establish their social statuses. It is plausible to assume that these beneficial influences of education could be amplified in the urban areas, through greater media exposure and availability of educational facilities (P.N. Mari Bhat and Francis Xavier 2003).

Most of these correlates affecting the relative survival of female children have been studied for regional pockets or for the country as a whole or sometimes for rural India alone. Given the perspective of this paper, it might be useful to study them in the urban context, based on data from two most recent available Censuses. Along with showing 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, this would also help understand the connections between female child survival and empowerment of adult women in urban India.

4. Empirical Models Analyzing Female Survival Disadvantage in Urban India

Before describing the empirical models and results from the econometric estimations a brief comment on the chosen unit of analysis is warranted. Research on female survival disadvantage in India has often focused on a north-south dichotomy in the treatment of females being reflected in regionally contrasting sex ratios (Miller 1981). Many of the factors associated with gender bias discussed in the previous section are indeed more intense in areas of northern India relative to the south. Women in southern India, for example, often retain close post marital connections with natal kin and unlike dowry, customs of bride price have been noted among several communities (Srinivas 1989).

Female employment and literacy rates are also higher (Table 1) and laws and customs often support female property inheritance. However, focusing on this north-south contrast excludes from its purview analysis of the treatment of females in the other parts of the country. Though preliminary analysis shows gender bias could be stronger in urban areas of northern India, no Indian state had CSRs favoring females in 2001. Further, the increases in both, female work participation and literacy rates in northern states suggest that female statuses have improved in these regions. So, while accounting for regional differences, it would be useful to understand the correlates of gender bias for the whole of urban India. The most recent Census of India (2001) provides information on twenty nine states and six union territories. While, a state level study may yield some interesting conclusions (Klasen and Wink 2003) some states are large in terms of area and population and may well hide heterogeneities within them. Study at the district level with regional dummies, lends itself to studying broad regional patterns as well as a more disaggregated study within regions. Factors associated with gender bias are not mutually exclusive and are interconnected with each other in determining the value of girl children across regions. This paper therefore uses the method of regressions, useful for generating *ceteris paribus* conclusions regarding the relative importance of different factors.

Analysis of District Level CSRs in the Decade of the Nineties

We begin the empirical analysis by analyzing CSRs in the urban areas of 430 districts of the country⁹ from the 1991 and the 2001 Censuses. Two indices of greater female achievement are summarized by the adult (above the age of 15) female work participation rates¹⁰ and female literacy rates¹¹. A lower total fertility rate (TFR)¹² also reflects empowerment to the extent that it captures the scope for engagement in extra household

activities and also reflects the extent to which women may control their reproductive lives. Overall availability of opportunities in a district is summarized by the adult male work participation rates and male literacy rates. Given that males are regarded as traditional breadwinners, higher percentages of working males signal work availability. Also, given that priority would be given to educating males, the male literacy variable is expected to capture the availability of learning opportunities in a district. Further, male literacy rates could also serve as a proxy for the overall level of awareness in a region. The percentage of population in urban areas of the district is also included as a variable to indicate the relative extent of urbanization within the district. Cultural compositions of districts are summarized by the percentages of SCs¹³ and the percentages of Hindus and Muslims. Additionally, three dummy variables for the south, west and east have been included to capture unobserved regional influences. Associations between CSRs and this set of explanatory variables are studied by separate OLS regressions for each year and a pooled model including a time dummy variable to capture the temporal effects on CSRs. By focusing on female literacy, female work participation rates and total fertility rates the empirical analysis would help understand the link between female child survival and possible facilitators of female empowerment in urban India. Secondly, it would help indicate whether the economic and cultural factors associated with gender bias and relative female child survival (or the lack of it) in India as a whole continue to be relevant for understanding female child survival rates in the specific context of urban India and if so whether these factors have had a persistent or a differential association over time in these regions in recent years.

INSERT TABLE 2 HERE (half page)

Table 2 presents some expected as well as some unexpected conclusions. Districts with high CSRs have a significantly lower percentage of adult female workers. This result is both consistent across time and conforms to past research. However, notwithstanding the positive channels through which female literacy could benefit the survival of more girl children, high female literacy is not associated with low CSRs. The expected inverse relationship is statistically insignificant for 1991 and becomes positive and highly significant both for 2001 as well as the pooled model. This result contrasts with earlier analyses and with our expectations about the role of female education in reducing gender bias in survival. The results also show “intensification” of gender bias with declining fertility rates (Monica Dasgupta and P.N. Mari Bhat 1997) and particularly districts with relative greater female survival disadvantage had significantly low fertility rates in 2001. This may clearly indicate the use of selective abortion by parents motivated by twin concerns of son preference and the opportunity cost of larger families. We shall reserve comment on this until the following section analyzing SRBs. Our results which associate higher CSRs with low fertility and high female literacy seem to suggest counterintuitive implications regarding relative female child survival and the empowerment of adult females in urban India.

Male work participation rates are significantly associated with higher CSRs. This association as in the case of female work is robust across time and also in case of the pooled model. Male literacy rates are associated with lower CSRs in 2001 as well as the pooled model. Though higher CSRs were 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 2001 model.

This result may be indicative of temporal spread of gender discrimination not necessarily restricted to 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 revisited in the concluding section. 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. Gender discrimination seems to 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 urban areas of the country. While 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 by preventing them from being born at all. Observed SRBs are the product of biological and health related factors affecting the survival of male fetuses and prenatal discrimination through sex selective abortion influencing the number of females born. So while exceptionally low SRBs could result due to greater male fetal wastage, higher than “normal” SRBs are indicative of intervention to prevent the birth of girl children. 397 districts in urban areas consistent with those studied in the previous subsection on

CSRs,¹⁴ had SRBs exceeding the world average of 105. These districts are analyzed next in order to understand the correlates of sex selection.

Figure 2 showing SRBs by educational achievements shows a distinct increase in masculinity with educational levels. Admittedly, risks of higher male fetus mortality may be higher for illiterate women (D. Jayaraj and S. Subramanian 2004) birth of more than seventy (per hundred) more male children to literate vis-à-vis illiterate women in urban areas of forty one percent of Indian states possibly points to the greater use of sex selection by literate women. The contradictions between the suggested empowering effects of female education and the inverse association found in Table 2 would be a prime focus in the analysis of SRBs in urban India.

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 as the ability to read and write with understanding any language (Registrar General 1991& 2001), a literate person may be without any formal level of schooling. Given greater knowledge and earning power associated with formal schooling and degrees, the effect of formal education on gender bias could be more distinct. Model 2 attempts to capture the association of different levels of female education with SRBs by considering as explanatory variables the proportion of female literates according to different levels of education. The proportion of female literates 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 considered¹⁵.

INSERT TABLE 3 HERE (half page)

As expected, female work participation rates have a significant negative association with SRBs in both models. Thus, even where SRBs are above the worldwide average of 105, they are *relatively* lower in districts with higher female employment. The associations with male work, male literacy and the religious and cultural variables are also consistent with Table 2. Female literacy continues to have a strong positive association with SRBs across the 397 districts. Model 2 shows this positive relationship to be sustained for all levels of female education apart from those with middle school level education. Size and significance of the coefficients reflecting categories of education above middle school level in fact implies districts with large percentages of highly educated females (above the middle school and college level) are also the ones with the highest SRBs. Since our analysis focuses on districts where SRBs are already higher than average, the regression results seem to indicate increasing use of sex selection by women educated above the middle school level.

These results are not entirely surprising and concur with regional studies showing greater prevalence of sex selective abortions among relatively higher educated women (Dasgupta 1987; Beverly Booth and Manorama Verma 1994; Sudha and Rajan 1999; Partha Dasgupta 2010) and disagree with broader national studies based on earlier censuses (Bourne and Walker 1991; Murthi, Guo and Dreze 1995) which suggest female education

to be associated with reduced female survival disadvantage. Notably, most studies do not exclusively focus on urban areas, and therefore point to the need for more such targeted studies.

A study of growth rates of female literates in different educational categories across urban areas of states from the 1991 and the 2001 Census shows the largest growth to have been in the category of those females with education above the middle school level followed by those who have education beyond college level (see Table 2 in Appendix). Growth of females educated beyond college level was comparatively higher in the southern and northeastern region relative to the more gender biased northern western and northwestern states. However, given the large growth in the percentage of females educated beyond middle school in some of the northern states one could expect to find large numbers of college educated females in these areas in the next Census. While it would be counterintuitive to suppose that 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 is clear that the channels through which education is thought to be associated with empowerment, clearly 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 discussion in the following section draws upon research at the level of all-India or rural studies and thus tries to construct the scope of similar research in the context of urban India.

5. Higher Education and Its Implications for Gender Bias in Urban India

Among the many channels through which female education is professed to reduce gender bias in survival an important one is by facilitating more employment and thus raising the economic value of daughters. While, *ceteris paribus*, female survival disadvantage is indeed inversely related to female work, one actually finds 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 through the country, the percentage of employed women among literates actually decreased between Censuses. Most striking is the relatively low work participation of women educated above college level. Though there was a slight increase in the work participation of such women more than three fourth of them were absent from the 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 an average. Notably, northeastern states with lower gender bias had a relatively large percentage of highly educated and technically trained women in the workforce and northern states with the sharpest gender bias had lower percentages of literate females as workers (detailed data not shown here). All of this suggests that even if female employment may be associated with reduced female survival disadvantage, higher education may not be associated with such work participation in many cases. This naturally warrants an enquiry into the purpose of obtaining higher education, if it were not paid employment.

Female literacy rates were below one percent in most provinces of British India and most upper and middle class women did not receive anything beyond most rudimentary

education until the 19th century (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 the girls will have to be prepared particularly for the work inside." This narrow gendered perspective of education has often meant better schooling for males who are seen as breadwinners and females obtaining higher education while "waiting" to be married (Anant Raoji Kamat 1976; Srinivas 1989). Education has thus been an agent for reinforcing gender stereotypes rather than that of allowing for more opportunities for women. The puzzling disconnect between female education and employment may not be surprising in retrospect.

Unlike the optional nature of female employment, marriage continues to be a central requirement of Indian society and ability to arrange appropriate marital alliances for daughters is an important vehicle for preservation and upliftment of Indian family status. While at first glance the discussion of marriage payments and dowry may seem to have little to contribute to understanding the connection between female higher education and female child 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 but circumstantial evidence suggests that given the combined expenditure on tuition, supplies and the opportunity cost of time,

higher education could be considered somewhat of a luxury in urban India and its association with greater female survival disadvantage may be reflective of greater discrimination among the prosperous. The tradition of hypergamy (arranging daughter marriages to families higher in the social hierarchy) implies striving among middle and upper class parents to marry daughters off to prosperous well established grooms. Though education might subsequently be used by women for better housework and childcare and not labor market participation, the role of education is often 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). Pressure of dowry may of course sometimes be lower with female earning power (Madan C Paul 1986), but educated females may not in many cases be participating in the labor market.

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 in India's urban centers (Kishwar 1986) and has been noted to be spreading among the rich (Heyer 1992) and among non-traditional communities (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 unborn and younger female children, it may be relevant to look into some available data. The crime department of the Indian government (Government of India 2008) publishes data on “dowry deaths” and while all cases of dowry may not be reported and all dowry demands may not lead to death, calculations show a seventy five percent increase in such deaths 1995 and 2008 with the Indian capital Delhi, accounting for the largest percentage of such cases. Cases of dowry related violence remain rampant throughout Indian cities and 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 girl child birth and survival 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 (through higher education) prosperity may enable women to use sex selection to obtain male children while simultaneously controlling fertility (Dasgupta 1987; Bhat and Zavier 2003). *Ceteris paribus*, Table 4 therefore indicates a possible sharper rise in SRBs as educational achievements increase and fertility rates keep falling. Secondly, prosperity could also result in relatively higher SRBs and CSRs by aiding the survival of male children. Male child (and fetus) vulnerability could be lowered with education (Peter Mayer 1999) while literacy may *enable* mothers to neglect undesired female children to a greater extent (Dasgupta 1987). The extensive literature on neglect of female children elaborates on unequal access to food (Bardhan 1974; Harriss 1991) and healthcare (Booth and Verma 1992; Abay Afsaw, Francesca Lamanna and Stephan Klasen 2010) and though many of these studies focus on India as a whole or on rural India alone the few studies based exclusively on urban

India (for example Booth and Verma 1992) do not show declining neglect with greater availability of resources in urban areas.

All of this suggests that female 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 girl children by availing 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) higher education may not be empowering in the absence of conferring self-worth to women. Women themselves though educated may lack the “.....freedom and power to question and reassess the prevailing norms and values” (Amartya Sen and Jean Dreze 2002) and desire to bear male children which may be intricately connected with female power and position within the household (Sharma 1984; Heyer 1992). Needless to say that 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 twin goals of rewarding fertility control and providing positive (mostly monetary) incentives for bearing and rearing girl children. The Girl Child Protection Scheme in Tamil Nadu (Asha Krishnakumar 2005), or the Ladli Scheme in Delhi (The Hindu 2008) are all cases in point. Incentives such as these may be effective in reducing gender biases among the poor, however, traditional biases favoring males are incredibly resilient and economic incentives may not be sufficient to improve the survival of girls when discrimination is propagated by economically prosperous households. In contrast to education and work, which are possibly relatively easily manipulated by state support, eliminating discriminatory

attitudes possibly pose the most challenging threat to the birth and survival of girls. The positive roles of education operate within a wider canvas of social settings and the cultural influences may be more powerful in determining the extent of son preference than the actual levels of education (Basu 1992). The strongly significant regional dummy variables are a case in point.

Sex selection by parents is a cumulative of historical biases and laws to ban it may remain as ineffective as the laws favoring female property inheritance or banning dowry (analogous to the relatively less successful laws favoring widow remarriage or those banning female infanticide in British India) as long as the deep rooted patriarchal origins of institutions remain unchanged. It is the socio cultural context which still seems to value the domestic and dependent roles of women, the parental responsibility to get daughters well married, the lack of resource flow between females and their natal families and male ownership of family property and till those attitudes alter male children will be preferred in urban India and cases of sex selection may continue to be unreported. These predictions run counter to earlier and recent research which implies a turnaround in female child survival disadvantage in India in the near future (Klasen and Wink 2003; Stephan Klasen 2008; Monica Dasgupta 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 nineties, leading to more male births 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 is 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 selective in the decade of the eighties (Anjali 1987). The complete results from the 2011 Census would not be available for a while. 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 relative female survival disadvantage in India is complex and continues to be determined by factors deeply entrenched in the cultural ethos. The concluding section, tries to tie together the major implications of the paper.

6. Conclusions: Weaving Threads Together

In contrast to popular beliefs about modernization working to automatically dilute patriarchal influences, feminist and developmental research has amply shown a negative relationship between female statuses and the level of development (Ester Boserup 1970). This study is another case in point. Female birth and survival disadvantage remains a stubbornly persistent feature of the Indian demography and female children 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 an 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, might suggest that the worst may be over, simultaneous large increases in masculinity of CSRs in some of the “female friendly” northeastern states implies the need to direct sharper focus on the issue of

missing girl children in urban India. The purpose of this paper is not merely to create another addition to the already burgeoning literature on sex ratios. It is aimed to draw attention to the fact that gender bias, commonly perceived as a feature of backward 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.

Our empirical results indicate that there may be little incentive for the rich to prefer female children, who may not be participating in the labor market, 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 female education and work participation to have reduced prenatal gender bias leading to similar predictions for India (Woojin Chung and Monica Dasgupta 2007). Though, the connection between female child worth through work and survival is reconfirmed in Section 4, data suggests that a relatively large percentage of women even when educated up to and beyond college level do not participate in the labor force and many female workers are illiterate. Scarcity of jobs for highly educated females could be part of the issue, but traditional biases regarding the outside work participation of women could also be a deterrent. If high levels of literacy and/or education are associated with greater female seclusion, empowerment of women may not follow as a corollary. Thus along with increasing educational opportunities for women and ensuring the availability of employment options for them, influencing the socio-cultural biases which restrict them from the labor force is important for increasing the survival of girl children and infants. It is possible as more and more women receive college education educational achievements

could translate into higher work participation rates for more females reducing gender bias. But, a significant contribution of this research is to conclude the possible persistence (if not intensification) of gender bias in future years, at least in the shorter term.

While this study has primarily focused on studying the associations with higher education, prosperity and gender bias, there are additional interesting issues in the regression analysis which 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 significant positive association between the percentage of SC population and both SRBs and CSRs implies that notwithstanding past research female children are possibly 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 female seclusion, dowry payments and withdrawal from paid work (Berreman 1993), a process described as *sanskritization* by Srinivas (1989). While Agnhotri 2000 does note lower female 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.

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. Though, an excess supply of males may be hypothesized to stimulate an increased *price* for women in a *laissez faire*

world, the extent to which price translates to *value* may take an adjustment spanning decades. For the narrower short run, manifestations of this shortage would more likely result in rising number of incidents of trading girls across regions and a further commoditification and devaluation of women (Jean Dreze and Reetika Khera's 2000). Association between prosperity and gender bias while pointing to the futility of state policies of reducing discrimination targeted at lower income groups, also indicates that mere legislation would bear little fruit. Changing these deeply entrenched gendered perceptions would require concerted efforts by the government and nongovernmental sectors (Dasgupta, Chung and Shuzhuo 2009).

This study of female survival disadvantage in urban India is at best a preliminary investigation into a phenomenon, which is complex and regionally diverse. The purpose of this paper is to elaborate relative female survival disadvantage as an ultimate expression of gender bias in a culture which continues to favor males socially and economically. Improving the birth and survival of female children requires an interdisciplinary emphasis and does not lend itself to easy policy recommendations. The difficulty of reaching foolproof 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 female work for greater female worth 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, their economic classes as well as their work statuses and

importantly whether discrimination was motivated by their own bias or a bias transferred from the households they belong to. 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 micro research on the missing girl children in urban India.

References

- ActionAid. 2008. *Disappearing Daughters*. Retrieved from on 12/22/2010 from http://www.actionaid.org.uk/101356/disappearing_daughters_india_sex_selection_crisis_worsening.html
- Agarwal, Bina. 1994. *A Field of One's Own: Gender and Land Rights in South Asia*. *South Asian Studies* 58. Cambridge University Press.
- Agnihotri, Satish. 2000. *Sex Ratio Patterns in the Indian Population: A Fresh Exploration*. New Delhi, Thousand Oaks and London: Sage Publications.
- Basu, Anderson, Siwan. 2007. "The Economics of Dowry and Brideprice." *Journal of Economic Perspectives*, 21(4).
- Anjali. 1987. "Prejudice against Girls-Abuse of Scientific Discovery." *Social Welfare*, 34.
- Asfaw, Abay, Francesca Lamanna and Stephan Klasen. 2010. "Gender gap in parents' financing strategy for hospitalization of their children: evidence from India." *Health Economics* 19(3).
- Bardhan, Pranab. 1974. "On life and death questions." *Economic and Political Weekly*, 9 (32-34), (Special Number, August).
- Basu, Alaka and Kaushik Basu. 1991. "Women's Economic Roles and Child Survival: the Case of India." *Health Transition Review* 1(1).

- Basu, Alaka. 1992. *Culture, the Status of Women and Demographic Behavior*, USA: Oxford University Press.
- Berreman, Gerald D. 1993. "Sanskritization as Female Oppression in India," in Barbara D. Miller ed. *Sex and Gender Hierarchies*. Cambridge University Press.
- Bhat, P.N. Mari and A.J. Francis Xavier. 2003. "Fertility Decline and Gender Bias in Northern India." *Demography* 40(4).
- Bloom, David E., and Gilles Grenier. 1983. "The Economics of Sex Preference and Sex Selection," in Neil G. Bennet ed. *Sex Selection of Children*. Academic Press.
- Booth, Beverly, and Manorama Verma. 1992. "Decreased Access to Medical Care for Girls in Punjab, India: The Roles of Age, Religion and Distance." *American Journal of Public Health* 82(2).
- Boserup, Ester. 1970. *Women's Role in Economic Development*. New York: St. Martin's Press.
- Bourne, Katherine L. and George M. Walker Jr. 1991. "The Differential Effect of Mother's Education on Mortality of Boys and Girls in India." *Population Studies* 45 (2).
- Chung, Woojin and Monica Dasgupta. 2007. "Why is Son Preference Declining in South Korea? The Role of Development and Public Policy, and the Implications for China and India." *Policy Research Working Paper No. 4373*. The World Bank.
- Coale, Ansley. 1991. "Excess Female Mortality and the Balance of the Sexes." *Population and Development Review* 17(3).

- Croll, Elisabeth. 2002. "Fertility Decline, Family Size and Female Discrimination: A Study of Reproductive Management in East And South Asia." *Asia-Pacific Population Journal* 17(2).
- Das Gupta, Monica 1987. "Selective Discrimination Against Female Children in India." *Population and Development Review* 13.
- -, and P.N. Mari Bhat. 1997. "Fertility Decline and Increased Manifestation of Sex Bias in India." *Population Studies* 51(3).
- -, Woojin Chung, and Li Shuzhuo. 2009. "Is there an Incipient Turnaround in Asia's "Missing Girls" Phenomenon?" *Policy Research Working Paper No. 4373*. The World Bank.
- Dasgupta Partha. 2010. "Progressive Kolkata has a Dark Secret. Female Feticide is on the Rise as Rogue Clinics Thrive." *Tehelka Magazine* 17(2).
- Dhruvarajan, Vanaja. 1990. "Religious Ideology, Hindu Women and Development in India." *Journal of Social Issues*, 46(3).
- Dreze, Jean, and Reetika Khera. 2000. "Crime, Gender and Society in India: Insights from Homicide Data." *Population and Development Review* 26: 335-352.
- Freed, Ruth. S., and Stanley A. Freed. 1998. "Beliefs and Practices Resulting in Female Deaths and Fewer Females than Males in India." *Population and Environment* 10(3).
- Government of India. 2008. *Crime in India*. National Crime Records Bureau. Ministry of Home Affairs.

- Harriss, Barbara. 1991. "The Intrafamily Distribution of Hunger in South Asia" in Amartya Sen and Jean Dreze eds. *The Political Economy of Hunger: Volume 1: Entitlement and Wellbeing*. USA: Oxford University Press.
- Jayaweera, Swarna. 1997. "Women, Education and Empowerment in Asia." *Gender and Education*, 9(4).
- Heyer, Judith. 1992. "The Role of Dowries and Daughter's Marriages in the Accumulation and Distribution of Capital in a South Indian Community." *Journal of International Development* 4 (4).
- Jayaraj, D., and S. Subramanian. 2004. "Women's Wellbeing and the Sex Ratio at Birth: Some Suggestive Evidence from India." *The Journal of Development Studies* 40(5).
- Kabeer, Naila. 1999. "Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment." *Development and Change*, 30.
- Kamala, Sarna. 2003. "Female Feticide on the Rise in India." *Nursing Journal of India*. Trained Nurses Organization.
- Kamat, Anant, Raoji. 1976. "Women's Education and Social Change in India." *Social Scientist*, 5(1).
- Kishor, Sunita. 1993. "May God Give Sons To All: Gender and Child Mortality in India." *American Sociological Review* 58.
- Kishwar, Madhu. 1986. "Dowry-To Ensure Her Happiness or To Disinherit Her?" *Manushi*, 34.
- Klasen, Stephan and Claudia Wink 2003. "'Missing Women': Revisiting the Debate." *Feminist Economics* 9(2-3).

- -2008. “Missing Women: Some Recent Controversies on Levels and Trends in Gender Bias in Mortality.” *Ibero-America Institute for Economic Research Discussion Paper NR 168*.
- Krishnakumar, Asha. 2005. “The Cradle Babies.” *Frontline* 22(11), May 21st-June 3rd.
- Kusum, 1993. “The Use of Pre-Natal Diagnostic Techniques For Sex Selection: The Indian Scene.” *Bioethics* 7 (2/3).
- Kynch, Jocelyn, and Amartya K. Sen. 1983. “Indian Women: Well-Being and Survival.” *Cambridge Journal of Economics* 7(3/4).
- Lundberg, Shelley. 2005. “Sons, Daughters, and Parental Behavior.” *Oxford Review of Economic Policy* 21(3).
- Mandelbaum, David G. 1991. *Society in India*. University of California Press.
- Mayer, Peter. 1999. “India’s Falling Sex Ratios.” *Population and Development Review* 25(2).
- McVay Pamela. 2008. *Envisioning Women in World History: 1500-Present*. McGraw-Hill.
- Meenakshi, J.V., Ranjan Ray, and S.Gupta. 2000. “Estimates of Poverty for SC, ST and Female-Headed Households.” *Economic and Political Weekly* 35(31).
- Menon, Nivedita. 1996. “The Impossibility of ‘Justice’: Female Feticide and Feminist Discourse on Abortion,” in Patricia Uberoi ed. *Social Reform, Sexuality and the State*. New Delhi: Sage Publications.
- Miller, Barbara D. 1981. *The Endangered Sex: Neglect of Female Children in Rural North India*. Ithaca: Cornell University Press.

- Murthi Mamta, Anne-Catherine Guio, and Jean, Dreze.1995. “Mortality, Fertility and Gender Bias in India.” *Population and Development Review* 21(4).
- Paul, Madan. C. 1986. *Dowry and the Position of Women in India. A Study of Delhi Metropolis*. New Delhi: Inter India Publishers.
- Registrar General, India. 1991. *Census of India*. New Delhi: Government of India.
- -. 2001. *Census of India*. New Delhi: Government of India.
- Retherford, Robert, and T.K. Roy. 2003. “Factors affecting Sex Selective Abortion in India.” *National Family Health Survey Bulletin* 17.
- Sen, Amartya K. 1990. “More than 100 Million Women are Missing.” *The New York Review of Books*, December 20.
- -2001. “Many Faces of Gender Inequality.” *Frontline* 18(22), October 27th-November 9th.
- -, and Jean Dreze. 2002. *India: Development and Participation*. Oxford University Press, USA.
- Sharma Ursula. 1980. *Women, Work and Property in North-West India*. Routledge Kegan and Paul.
- Srinivas, Mysore, Narasimhachar. 1984. *Some Reflections on Dowry*. Delhi: Oxford University Press.
- -, 1989. *The Cohesive Role of Sanskritization and Other Essays*. USA: Oxford University Press.
- Sudha, Shreeniwas, and Irudaya Rajan.1999. “Female Demographic Disadvantage in India, 1981-1991: Sex Selective Abortions and Female Infanticide.” *Development and Change* 30.

- The Hindu. 2008. "Ladli Scheme for Girls Ready to Take Off." *The Hindu*, February 26.
- Van Willigen, John and V.C. Channa. 1991. "Law, Custom and Crimes Against Women: The Problem of Dowry Death in India." *Human Organization* 50.
- Waldron, Ingrid 1993. "Recent Trends in Sex Mortality Ratios for Adults in Developed Countries." *Social Science and Medicine* 36(4).
- Waldron, Ingrid 1998. "Factors Determining the Sex Ratio at Birth," in *Too Young to Die: Genes or Gender?* New York: United Nations.
- Ware, Helen. 1994. "Effects of Maternal Education, Women's Roles, and Child Care on Child Mortality," in W.H. Mosley and L.C. Chen ed. *Child Survival: Strategies for Research, Supplement to Population and Development Review* 10.
- Williamson, Nancy E. 1976. "Sex Preferences, Sex Control, and the Status of Women." *Signs* 1(4).

¹ The sex ratio in the Indian Censuses has been defined as the number of females per thousand males. This paper however uses the more conventional definition of males per hundred females.

² Data on SRBs was also erstwhile difficult to obtain, leading researchers to rely on indirect estimations (S. Sudha and 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 1756 towns listed in the 2001 Census. Municipal corporations are the urban local governance bodies for cities with population above 3 million. Municipalities, municipal councils, committees and boards govern smaller towns. After adjustments for comparability I have used data for 1704 towns for which comparable data is 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. Smaller towns variously called census towns; gram panchayats, nagar panchayats etc. have also not been included in this dataset.

⁴ The overall sex ratio in urban India declined from 111.88 in 1991 to 111.05 in 2001. Though the rural urban break up is not yet available for the 2011 Census, provisional data indicates a sustained decline in the total sex ratio from 107.19 in 2001 to 106.35 in 2011.

⁵See for example Sen (1990); Ansley Coale 1991; and Stephan Klasen and Claudia Wink 2003.

⁶ National and state level calculations supporting this section have not been presented here and are available on request from the author.

⁷In contrast to a 0.41 percent increase in females above the age of 7 years above that predicted by the sex ratio in 1991, there was a 0.79 percent decrease in the corresponding number of female children 0-6 years in urban India between 1991 and 2001.

⁸ It should be mentioned here that Sikhism is the main religion followed 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% 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.

⁹ The most recent (2001) Census of India provides data for 593 districts. However, some districts do not have any urban regions and have been left out from this analysis. Further, the 1991 Census was not held in Jammu and Kashmir and hence those districts have been left out in this analysis for comparability. Also, additional districts have been carved out of the existing ones in the 2001 Census accounting for greater number of districts in the later Census. Data on the new districts have been added together to ensure comparability with the 1991 district.

¹⁰ Census data on female workers is used to capture female 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 2001). Frequent changes in the definition of work have made longitudinal studies based on Census data difficult. However, definitions of work did not drastically change between 2001 and 1991 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 enumeration of female 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 which are associated with monetary gain. While measuring invisible women workers is vital for understanding their contribution to the economy, work associated with remuneration is important for guaranteeing a command over resources leading to greater female worth. Thus urban female work participation rates used in this analysis have thus been computed using Census data.

¹¹ The Census of India defines literacy as the ability to read and write any language with understanding (Registrar General 1991& 2001).

¹² 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.

¹³ As noted earlier, behavioral differences between SCs and STs make it difficult to club them together. Given that the ST population comprises only 2 percent of urban Indian population, and is totally absent from some states like Punjab, Haryana and Delhi where female children are most disadvantaged, this study only includes the percent of SC population.

¹⁴ Districts of Jammu and Kashmir have been omitted to maintain comparability with the previous analysis. As mentioned earlier, the 2001 Census lists additional districts carved out of the existing ones in 1991, listing a total of 558 districts consistent with the 430 studied earlier. These districts while clubbed together to maintain parity in comparison in the previous analysis have been considered separately in this analysis dealing with the 2001 Census alone.

¹⁵ Denominators for the categories 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 literates below the age of 9 and so this ratio has been calculated as a percentage of the population above 9 and so on. We have considered different age groups for the different levels of education, in order to remove the effect of differing age compositions in the different districts.