FERTILITY & EMPOWERMENT NETWORK WORKING PAPER SERIES

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October 2012

007-2012-ICRW-FE

ICRW International Center for Research on Women
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RECOMMENDED CITATION

Pande, Rohini P., Anju Malhotra and Sophie Namy. (2012). *Fertility Decline and Changes in Women's Lives and Gender Equality in Tamil Nadu, India*. International Center for Research on Women Fertility & Empowerment Working Paper Series. 007-2012-ICRW-FE. Pages 1-46.

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The Fertility & Empowerment (F&E) Network is a group of academic and applied researchers committed to reinvigorating the connection between gender, fertility decline and development through both theoretical and applied research. The F&E Network is housed at the International Center for Research on Women and funded by The William and Flora Hewlett Foundation. The F&E Network aims to advance a research agenda on issues intersecting these three themes that is of interest to researchers and policymakers alike, and to support the professional development of experienced and emerging scholars with an interest in gender and population.

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ACKNOWLEDGEMENTS

ICRW and the Fertility & Empowerment Network gratefully acknowledge funding and support from The William and Flora Hewlett Foundation.

The Fertility & Empowerment Network wishes to thank Consultative Group members Alaka Basu, Sunita Kishor, Karen Mason, Tom Merrick, Susan Newcomer, and Herb Smith for their conceptual and technical expert guidance on network efforts. In addition, the network greatly benefitted from the support of Ann Biddlecom, Jay Gribble, and Amy Tsui toward developing an actionable research agenda.

Fertility Decline and Changes in Women's Lives and Gender Equality in Tamil Nadu, India

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ABSTRACT

In this paper we analyze the relationship between fertility decline, and changes in women's lives, gender equality and gender relations in the Indian state of Tamil Nadu over the last 40-50 years. Using secondary quantitative analysis, published and unpublished quantitative and qualitative research, and interviews with experts, we examine how fertility decline in Tamil Nadu manifested in changes in the social and economic value of children, the shift from a focus on having a large quantity of children to investing more in fewer children, and the shrinkage of women's lifespan devoted to childbearing. In turn, we explore how these changes have influenced specific domains of women's lives, gender equality and gender relations. We also describe how Tamil Nadu's history of progressive social activism, combined with economic poverty until recently, has influenced these dynamics. We find that, following fertility decline, women's lives have improved in the realms of higher education, marriage spousal choice, and – to some extent – employment opportunities. Gender inequality also has decreased in education and employment. However, these changes have yet to lead to notable shifts in societal gender relations and norms, as manifested in marriage practices, dowry, and intimate partner violence.

Key words: gender, fertility decline, India

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INTRODUCTION

Fertility levels have declined in many developing countries over the last four decades. The resulting change in demographic patterns has widespread implications for growth rates, dependency ratios, consumer markets, and societal relations ((Abbasi-Shavazi, Mohammad Jalal & McDonald, Peter, 2006); (Amin, Sajeda D. & Lloyd, Cynthia B., 2002); (Fargues, Philippe, 2005); (Demeny, Paul, 2003)). These changes are likely also to influence gender relations and inequalities. However, while addressing gender inequality is increasingly important in development agendas and efforts to understand the determinants of gender inequality are well underway, an examination of the role of fertility decline in triggering changes in these spheres is largely missing.

In this paper, we address this gap by undertaking a historical analysis of data from various sources collected in Tamil Nadu, India from the 1970s to the present. Our central question is: *How and to what extent has fertility decline contributed to improvements in women's lives, gender equality and gender relations*? Specifically, we examine, for the last 30-40 years:

1. What have been the nature and scope of changes in women's lives and gender inequality in the domains of education, employment and customary roles and responsibilities in the home?
2. Have societal gender relations shifted towards less patriarchal, more egalitarian norms, as manifested in marriage rules, dowry and intimate partner violence?
3. To what extent, and through what mechanisms, has fertility decline contributed to both positive and negative shifts in women's lives, gender inequality and gender relations?
4. How have changes in the social, economic, cultural and policy landscape of Tamil Nadu influenced both fertility decline and the relationships between fertility decline, women's lives, gender inequality, and gender relations?

Our analysis demonstrates that the influence of fertility decline on women's lives is not one dimensional, but rather varies across different domains of their lives. There have been significant shifts towards greater gender equality in non-domestic spheres of life such as education and employment. Still, the influence of fertility decline on gender relations in the domestic sphere—in areas such as marriage, dowry, and intimate partner violence—is more equivocal. These juxtapositions between women's opportunities outside the home and gender relations in the domestic or customary spheres create an ongoing dialectic whose resolution is, as yet, unclear.

BACKGROUND

Scholars argue that low fertility levels coinciding with other social changes—such as delayed marriage and favorable employment conditions for women—can dramatically change women's lives. For example, these developments can reduce the centrality of marriage, motherhood and domestic roles in women's lives (Davis, Kingsley & van den Oever, Pietronella, 1982); (Davis, K., 1984), thereby weakening patriarchal systems that are based on these definitions of women's place in society and triggering a change in gender relations as women's – and perhaps men's – roles change. At the individual level, by reducing the time devoted to childbearing, low fertility can provide women the time and space for greater involvement in non-domestic spheres, such as higher education, careers or political participation (Huber 1991; (Joshi, Shareen & Schultz, T. Paul, 2007).

Since the 1960s, economists have noted that a decline in fertility can be associated also with a shift from an emphasis on the quantity of children to a focus on "quality" of children, namely that women (and men) have fewer children but invest more in the human capital formation of each child (Becker 1960, (Joshi, Shareen & Schultz, T. Paul, 2007). According to Malhotra (2009) this shift in focus from high quantity to high quality of children could potentially lead, in turn, to a shift in the requirements and meaning of motherhood in ways that allow women more time and space to explore other opportunities. She argues that children's high social and economic value in a traditional system where their labor is an important asset creates powerful incentives to control women's sexuality and reproduction as "reproducers" of these valuable "assets." Once children's social and economic value changes such that greater investment is required in children, and immediate labor or other benefits are less forthcoming, then this motivation to control or subjugate women should decline, and so should the power of patriarchal societies based on this control.

Folbre (1983) notes that shifts in the value of children may trigger changes in gender relations also because these shifts can be gender-specific, namely, that there can be a reversal in the costs and benefits of children between men and women. In high fertility regimes, men arguably reap a greater share of the benefits of having children relative to the costs of bearing and raising them, while women bear the majority of childbearing costs. When fertility declines, as households invest more in children, and as children no longer play the same economic and social role they do in labor-intensive traditional systems, the balance may switch. Men may enjoy less of the social and

economic benefit while bearing more of the costs, while for women, the costs in time and energy of childbearing may decrease as the number of children they have to take care of decreases.

Feminists and reproductive health advocates, including the advocates and framers of the "Cairo Agenda" for the 1994 ICPD conference, see effective and meaningful control of contraceptive options by women as part of fertility decline also as a precondition for shifts in patriarchal social systems (Malhotra, Anju, 2009). They argue that if women control contraception, they control a critical aspect of their lives, which, in turn, becomes an empowering process that can redefine patriarchal institutions and family structures (Dixon-Mueller, R. & Germain, A., 1994); (Germain, A., 1987) and change women's lives.

Empirical evidence from industrialized countries supports the transformative potential of fertility decline for women. This evidence also highlights the critical importance of contextual factors in facilitating such transformation. For instance, research from the US in the 1960s argues that the introduction of the oral contraceptive pill coincided with other favorable social, economic and political changes that allowed women the opportunity to control their reproductive lives (Joshi, Shareen & Schultz, T. Paul, 2007), and enhance their educational and labor market opportunities (Birdsall, Nancy & Chester, L. A., 1987); Gordon, 2002).

Studies in the developing world find that in countries as diverse as Taiwan, Thailand, Bangladesh and Egypt, fertility declines have contributed to enhancing women's opportunities and empowering them to take advantage of increased education, credit, and employment (Amin, Sajeda D. & Lloyd, Cynthia B., 2002); Schuler et al. 1995; Hardee, Xie & Yu 2004). Lee-Rife et al. (2010), in their macro study of over 30 countries, found that a preponderance of countries demonstrated changes in women's labor force participation and post-secondary education that were concurrent with, or followed, fertility decline. However, these are among a handful of studies in developing countries; overall, the evidence from low and middle income countries on the impact of fertility decline on gender inequality, women's lives and gender relations is scarce (Malhotra, Anju, 2009); Lee-Rife et al. 2010).

Our study adds to the current research in several ways. First, our trend analysis allows the opportunity to examine several contextual aspects of the fertility-gender relationship over time that cross-sectional and cross-country analyses may not achieve. Second, by focusing on India, we contribute to the limited research on this topic in developing countries. Third, we link fertility,

family planning, and gender concerns through a historical, multidisciplinary perspective that is rare.

Tamil Nadu provides an appropriate focus for our study for several reasons. Empirically, fertility decline has continued for long enough that we can potentially examine its influence on aspects of women's lives, gender inequality and gender relations where change may take some time to manifest. Further, Tamil Nadu has had a long history of active policy and civil society debates and actions around fertility and family planning, social and economic development, gender inequality and opportunities for women. At the same time, the state has faced high levels of poverty until recently. This mix of high social and low economic development, combined with a history of gender and social activism, provides rich ground in which to examine the role of different contextual dynamics in the relationship between fertility decline and gender. Finally, as one of the largest and most populous states in India, findings from Tamil Nadu are likely to have important implications for policymakers interested in the fertility-gender connection.

METHODS AND DATA

The lack of appropriate, complete data that can prove causality is one reason for the paucity of rigorous, quantitative research on fertility decline as a determinant of changes in women's lives, gender inequality and gender relations. The inherent complexity of the fertility-gender relationship -- that the relationship is bi-directional, and that the context within which fertility change occurs is likely critical to the way fertility influences gender -- also certainly contribute to this gap. This complexity raises the question of what analytical methods could be most effective to examine this relationship. Recent literature on causation in relation to demographic phenomena posits that the complexity of causation in such phenomena overall calls for an eclectic approach that goes beyond micro-level regression or experimental methods. Proponents argue that analysis of such phenomena should embrace as many viewpoints as possible, and use as many types of data as available, whether quantitative, qualitative, anecdotal, or content analysis (Bennett & George 1997; Bachrach & Nichols 2003; Smith 2003; Bhrolcháin & Dyson 2007).

At the same time, if all the data required for such an eclectic analysis is unavailable, at best researchers can provide provisional conclusions. It is also not always possible to tease out and differentiate between alternative causal pathways to identify that which is critical to the outcome, sometimes because these pathways are so tightly inter-connected. In such cases, Bhrolcháin & Dyson (2007) propose ten criteria for proving causality. Yet, they also note that, in cases where "we

cannot establish with certainty the full set of causal linkages" it is acceptable to base an understanding of causation "…on patching together theoretical models, anecdotal reports, plausible guesswork, and firm evidence" (p14). Researchers also argue that, even when a complete causal chain is not fully understood or proven, the knowledge of causal mechanisms can be a useful input into policy discussions or interventions (Bennett & George 1997), and reasonable interpretation can follow from "knitting together" available "strands of evidence" (Bhrolcháin & Dyson 2007; p 29).

We follow this approach in our paper. Specifically, we analyze the evidence on the causal mechanisms and pathways through which the *timing* and *nature* of fertility decline in Tamil Nadu, particularly in the 1970s, relates with the *timing* and *nature* of changes in a sub-set of domains in women's lives, gender inequality and gender relations post-1970s, and the particular set of contextual conditions under which these changes occur. We suggest interpretations of the fertility-gender relationship that are consistent with the available data, and highlight the gaps in evidence to-date.

We use a combination of several types of quantitative and qualitative data, published and unpublished literature, and interviews with experts. We use quantitative data for a 30-40 year period through to the present from a variety of sources to examine trends in fertility, other demographic indicators, contextual conditions, and measures of women's lives and gender inequality. Our sources include: tabulations from the Indian Sample Registration System (SRS), the decennial Indian Census, the National Family Health Surveys (NFHS), the National Sample Surveys (NSS), the Operations Research Group (ORG) family planning surveys from the 1970s and 1980s, the Planning Commission reports, and data collected by India's central and state Education and Health ministries. We also conduct secondary analysis using the NFHS, and from NSS datasets accessed through the Integrated Public Use Microdata Series (IPUMS), International Database.

Our qualitative data primarily comprise information from anthropological or sociological articles and books and unpublished manuscripts. In addition to the academic literature, we include articles and viewpoints published in a variety of local and national newspapers, Internet sites and weblogs, and state and national government policy documents and pronouncements.

Finally, we used an informal unstructured guide to interview 16 experts on Tamil Nadu, specifically: 2 demographers, 2 economists, 1 education specialist, 3 anthropologists, 4 senior program managers in public and reproductive health, 2 senior government officials, and 2 senior staff

persons from donor organizations.[1] We selected our interviewees based on peer recommendations; frequent authorship and citation on specific issues; recommendations by others we interviewed; and availability. The aim of these interviews was threefold; first, to guide us to useful data sources we had not yet tapped; second, to help fill gaps in our knowledge about issues for which there may not be any hard data, and; third, to provide added contextual expertise on themes and trends.

CONCEPTUAL FRAMEWORK

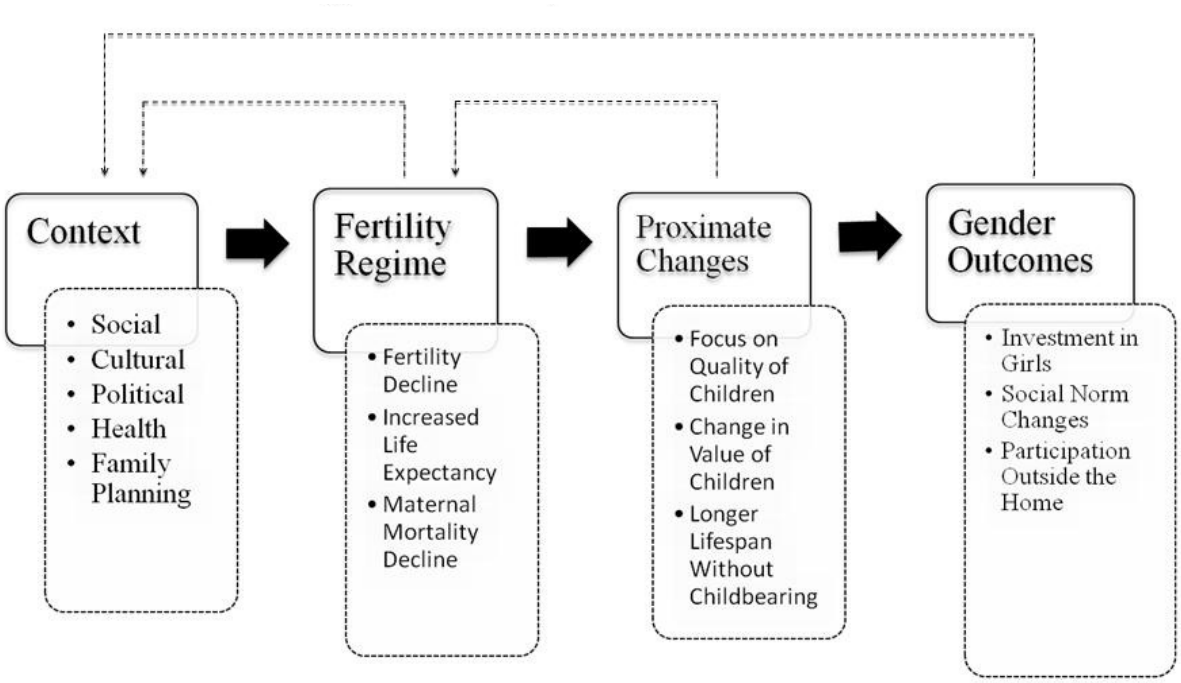
Our central question is: How has fertility decline contributed to improvements in women's lives, gender equality, and gender relations in Tamil Nadu over the last 30-40 years? Although changes in gender equality and gender relations can have implications for women and men, we focus only on women.

Our conceptualization of the pathways from fertility decline to gender-related outcomes (Figure 1) follows the framework developed by Malhotra (2009), and the analytic and methodological philosophy of analyzing complex demographic phenomena outlined above. Our starting point is that the historical, political, socio-cultural and economic context of a society shapes the nature and extent of fertility decline *and* influences how fertility decline affects gender relations, women's lives, and gender inequality. Our conceptual framework illustrates also the bi-directionality of the fertility-gender relationship. Baseline gender relations and other contextual conditions set the stage for fertility decline, and fertility decline, in turn, triggers subsequent changes in gender relations, gender inequality and women's lives. Finally, we posit that these relationships are likely to be influenced by the nature of the immediate or proximate child- and health-related changes that typically accompany fertility decline.

Baseline context: We describe Tamil Nadu's socio-political and economic characteristics, as well as higher education and employment opportunities for women, gender relations and gender inequality in the state prior to its fertility decline of the 1970s. We examine also the development of the state's health and family planning policy and programs, including the extent to which these policies were women-friendly.

[1] To protect confidentiality, we cite our key informants as follows: (KII [Key Informant Interview], type of informant).

Figure 1: Conceptual Framework



Fertility regime: The demographic transition theory argues that a low fertility regime is one that not only has reached low levels of fertility, but also mortality decline. Some of this decline – such as in maternal and neonatal mortality – may be related to fertility reduction. Other mortality improvements, such as in life expectancy and child mortality, may be related in part to fertility decline and partially to other social, economic and public health improvements. We explore how improving social and economic conditions and strong public health and family planning efforts influenced fertility decline; we also examine the inter-connection between improvements in maternal mortality, women's life expectancy, and fertility decline as part of a single fertility regime.

Changes in women's lives, gender relations and gender inequality: We analyze how fertility decline is associated with women's lives, gender relations and gender inequality, as defined above, across the domains of: (a) investment in girls (through changes in sex ratios, and increases in girls' secondary and post-secondary schooling); (b) participation by women outside the home (women's labor force

participation); and (c) changes in gender norms as reflected in marriage rules, dowry patterns and intimate partner violence.

Proximate changes: Malhotra (2009) posited four "conditionalities" that determine whether and how the shift to a low fertility regime influences changes in women's lives, gender inequality and gender relations. We modify the original conditionalities to examine how three specific proximate changes accompanying Tamil Nadu's fertility decline may have influenced the fertility-gender relationship in this case. These proximate changes are: (1) a change in the social and economic value of children; (2) a shift in parental focus from quantity to quality of children; and (3) a longer life span for women spent without childbearing. We explore the evidence for whether a shift in parental focus from quantity to quality of children has contributed to greater investment in girls. Second, we analyze whether fertility decline is accompanied by a shift in the social and economic value of children, and its implications for gender relations and women's lives. For instance, does the value of children change in ways that open a space for women's primary role to shift from motherhood to non-domestic roles such as employment outside the home? Does this, in turn, transform marriage and dowry norms or relations between husbands and wives? Third, fertility decline, accompanied by lower maternal mortality, means a longer lifespan for women without childbearing, and we analyze what this means for gender relations and women's lives. For instance, does a longer lifespan outside of childbearing allow women the time to explore alternative opportunities – such as employment -- outside the domestic sphere? How do these opportunities shift gender inequality in higher education and employment?

Significant changes in women's lives, gender relations or gender inequality are unlikely to materialize or be observable in less than a decade after lower fertility levels start becoming commonplace (Malhotra, 2009). Consequently, we examine "baseline" contextual conditions in Tamil Nadu pre-1970, fertility decline from 1970 onwards, and change in women's lives, gender relations and gender inequality (as well as in specific, relevant contextual conditions) post-1980s.

CONTEXT UNDERLYING TAMIL NADU'S FERTILITY DECLINE

Socio-Political Conditions

Tamil Nadu's socio-political landscape has contributed to rising aspirations, especially among poorer, marginalized groups, that many researchers have linked to subsequent fertility decline (Visaria 2009; Savitri 1994; Krishnamoorthny et al 2005; Racine & Racine 1998; Seshadri 2008). From as early as the 1920s, organized political, social and civil activism has focused on addressing

caste discrimination faced by the "backward" castes,[2] particularly *Dalits*. One of the best-known proponents of such movements, E. V. Ramasami Naicke, commonly known as Periyar, is often credited as instrumental in Tamil Nadu's subsequent social progress (Antony 2005).

Following Periyar, successive state governments instituted subsidies and reservations for lower castes that have contributed to a steady increase in the political, social and economic power of Dalits (Racine & Racine 1998). Education subsidies in particular, have been critical as these have meant that schooling has been widely available to all, and especially to disadvantaged groups, for at least the last 40-50 years (Visaria, L., 2000). Partly as a consequence of these efforts, Tamil Nadu has had higher levels of literacy than India as a whole for several decades. In 1931 Tamil Nadu matched the all-India literacy rate (for persons age 7 years and above) for women (2.9%), and had a higher rate for men (20%) compared to India as a whole (16%). By 1971, Tamil Nadu had overtaken the national average by a wide margin: almost one-third of Tamilian women (26.9%) and half of Tamilian men (51.8%) were literate, compared to 18.7% of women and 39.5% of men in India overall (Census of India 2001, various sections[3]). Thus, pre-fertility decline, Tamil Nadu was already significantly more literate than the rest of the country, particularly in the case of female literacy.

The cultural landscape has facilitated the rise in aspirations also. Since at least the 1960s if not earlier, cinema and other mass media has been the mainstay of popular culture in Tamil Nadu. In addition to being a centerpiece of popular culture, cinema has also long been inextricably linked to Tamil politics. Since 1967, every Chief Minister of the state has emerged from the film world (Ramasundaram, S., 1995)). Ramasundaram (1995) posits that such a long-standing exposure to the glittering worlds portrayed in Tamilian cinema and by Tamilian film star-politicians likely played a role in raising people's aspirations for their own lives.

Economic Development

On the economic front, however, the state has not presented such a sanguine picture until recently. Though changing definitions make it challenging to compare cross-time poverty estimates in India, still, in the 1960s and 1970s Tamil Nadu was unequivocally one of four "highly poor states" in the

[2] "Backward" classes are those identified by the Government of India as particularly socially and economically disadvantaged and thus requiring special policy interventions.
[3] Tamil Nadu literacy data are from: http://www.tn.gov.in/deptst/Areaandpopulation.pdf and all-India literacy data are from http://www.imaginmor.com/census-of-india-2011.html, Statement 21.

country. Through the early 1980s more than half of the state's population was designated as "poor" (Bandhyopadhya 2010). Until the 1980s Tamil Nadu's poverty ratio, as then defined, was higher than that of all-India, declining noticeably only from the late 1980s (Bandyopadhya 2010; Vijayabhaskar et al. 2011).

Still, in combination with political and cultural factors, economic reforms despite poverty during the 1960s and 1970s may have been important initial triggers of change in people's economic hopes. This period saw a period of agrarian reform and a shift away from agriculture to manufacturing and services as key contributors to the economy. This was also a period of rapid urban growth and large-scale state investment in infrastructure (roads, transportation, medical facilities, educational facilities). The resulting strong urban-rural connectivity allowed rural people to increasingly access urban services (Nagaraj, K., 2000); (Kocher, J. E., 1980); (Savitri, R., 1994) and likely contributed to the rise in aspirations noted above.

Historically Tamil Nadu has also had higher levels of female labor force participation than other states. In the 1971 census, almost 18% of the total rural female population was categorized as "working"; this increased to 28% in the 1981 census. For both census years, these figures were notably higher than all-India percentages for rural women's work, and among the highest of all states (Nayyar, Rohini, 1987). Traditionally, as in the country as a whole, agriculture has been by far and above the main employer for Tamilian women (Jha 2006; Das 2006; Neetha 2009). It is likely that given overall levels of poverty in the 1970s, a large motivation for women's employment at that time, particularly in rural areas, was related to the poverty of their households (Unni, Jeemol, 1988).

Gender Relations, Gender Inequality and Women's Lives

Tamil Nadu follows what is termed the "Southern," relatively more egalitarian pattern of gender relations compared to most North Indian states (Dyson & Moore 1983). A key characteristic of the Southern pattern is the prevalence of endogamous (cross-kin and within-village) marriages. Unlike women in much of northern India, Tamilian women in most castes traditionally married within the kin network and/or the community. This meant that young women typically continued to have contact with, and support from, natal kin even after marriage. Nonetheless, even in this context, richer, upper caste and Brahmin households have long followed the north Indian pattern of exogamous marriage, with a daughter leaving the natal household and inheritance passing through sons rather than daughters. (Heyer, Judith, 1992); (Kapadia, K., 1993). Also, as in Northern kinship

patterns, dowry has long existed in parts of Tamil Nadu in the form of some amount of gift giving from the bride's family to the groom's (Heyer, Judith, 1992). However – at least among certain caste groups – women have had more control over their dowry post-marriage than is the case in exogamous north Indian marriages (Nishimura, Y., 1994); Srinivisan & Bedi 2007). Tamil Nadu's Southern gender patterns have also been typified by high female labor force participation relative to northern states, as well as higher education levels going back to at least the 1960s.

At the policy level, the state has a history of women-friendly social reform. Periyar placed gender equality high on his agenda in matters as diverse as property rights, marriage, widowhood, education and contraception (Antony 2005; (Anandhi, S., 1991; Anandhi, S., 1991). Broader social movements in Tamil Nadu that have improved the position of Dalits have also given Tamilian women a longstanding history of collective action (Seshadri, S., 2008).

Family Planning, Health, and Population Philosophies and Policies

Early social activists in Tamil Nadu, including Periyar, embraced family planning as a social cause and as a way to address gender inequality in conjugal relations (Anandhi, S., 1991). Some, though, concerned about population control, set up a neo-Malthusian League and brought out a periodical called the Madras Birth Control Bulletin (Bhan, G. Panda P., 2010); (Nagaraj, K., 2000). Overall, family planning in Tamil Nadu has since continued to garner strong commitment from all levels of the government (Rouyer, A. R., 1987); Srinivasan et al. 1991; (Ramasundaram, S., 1995). From the 1960s, if not earlier, political workers and local senior administrators presided over marriages in their jurisdictions and would "talk forcefully about family planning and the 'small family norm'" (Antony, T. V., 1992). For several decades the Tamilian government has used mass media to promote smaller families; this message has also seeped into popular mass media such as cinema, spreading the idea of a small family as a "modern" one (Antony, T. V., 1992); (Ramasundaram, S., 1995).

Some experts note that the quality of Tamil Nadu's family planning services vary tremendously across districts and between rural and urban areas, with particularly poor coverage in rural, more disadvantaged districts (KII: 2 program managers; Srinivasan et al. 1991). Others have commented on the exceptional efficiency and strength of Tamil Nadu's family planning program (Antony, T. V., 1992); Srinivasan et al. 1991; (Das Gupta, Monica & Shuzhuo, Li, 1999); KII: 2 donor staff, 2 senior government officials). Still others argue that the content and focus of the program has not been notably different from that of other states (Krishnamoorthy, S., Kulkarni, P. M., & Audinarayana, N.,

2005), and that its success arose not because of a radically different approach to family planning– in fact the focus was on female sterilization like elsewhere in the country – but rather because of excellent infrastructure and management which allowed for better implementation than elsewhere (KII: 1 donor staff).

The Tamilian state has also been committed to overall public health since at least the early 1900s, with a State Health Department since 1922 and a Public Health Act dating back to 1939 (Das Gupta, Monica, Chung, Woojin, & Shuzhuo, Li, 2009). The state's success in addressing infant and child mortality and high maternal mortality has been lauded as an example to emulate (Gupta, M. D., Desikachari, B. R., Somanathan, T. V., & Padmanaban, P., 2009); (Ravindran, T. K., 2009). As early as 1961, the infant mortality rate in Tamil Nadu was 89 for males and 82 for females, compared to 122 and 108 for males and females, respectively, in India as a whole.[4] Life expectancy for females and males has been higher in Tamil Nadu than in India as a whole since the late 1800s.[5] Historical maternal mortality data are harder to find, but estimates from 1982-86 show Tamil Nadu's maternal mortality ratio at 372 compared to India's 580.[6] Well-delivered public health services have undoubtedly boosted the confidence of both the public and officials in their ability to deliver also a strong family planning program (Antony 1992).

Overall Context of Tamil Nadu's Fertility Decline

Thus, by the 1970s, when fertility was poised to register its fastest declines in the state, Tamil Nadu was already at relatively high levels of social development such as wide access to higher education, high employment levels and state and civil society attempts to address social and gender inequalities. Kinship norms made for a more gender egalitarian societal structure than in northern India, and gender inequalities in education and employment were smaller than elsewhere. The Tamilian state also had well-functioning public health and family planning systems, and had achieved levels of infant mortality, life expectancy and maternal mortality better than those for the country as a whole. At the same time, Tamil Nadu was one of the country's poorest states, albeit one with rising urbanization and a notable shift from agriculture to manufacturing and services sectors of the economy. This juxtaposition of relatively low gender inequality and rapid social

[4] Economic Survey 2010-11; Sample Registration System, Office of Registrar General, Ministry of Home Affairs (http://planningcommission.nic.in/data/datatable/0211/data%20118.pdf)
[5] SRS Based Abridged Life Table, Sample Registration System, Office of the Registrar General, India (http://www.tn.gov.in/deptst/Vitalstatistics.pdf)
[6] Mari Bhat, Indirect Estimates (http://www.iussp.org/Brazil2001/s10/S16_01_Bhat.pdf)

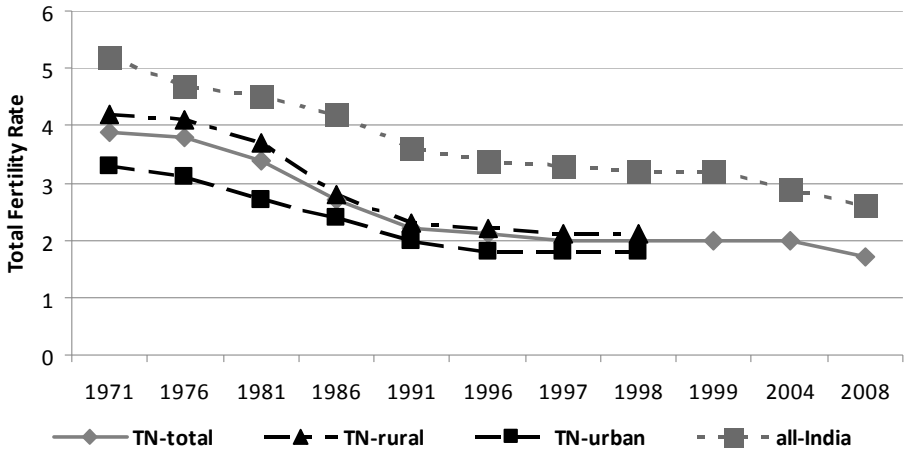
development on the one hand, with limited economic growth on the other hand, contributed to a society where large sections of previously disadvantaged groups had rising social and economic aspirations, but in a context of persistent poverty and limited resources (KII: 1 education specialist; (Visaria, L., 2000); (Anandhi, S., Jeyaranjan, J., & Krishnan, R., 2002). The most rapid period of fertility decline in Tamil Nadu occurred in this context.

FERTILITY DECLINE: TRENDS, PATTERNS AND DRIVERS

Trends and Patterns in Tamil Nadu's Fertility Decline

The 1911 Census of India recorded Tamil Nadu's total fertility rate (TFR) between 1901-1911 at 5.1. Though fertility in Tamil Nadu has followed a downward trajectory since then, declines were small and erratic until 1961-71, speeding up and becoming consistent only after that (Rajna, P. N., Kulkarni, P. M., & Thenmozhi, N., 2005). The sharpest decline from the 1960s through to the present was between 1976-1981. Also, from 1971 to 2008 Tamil Nadu's TFR for the whole state and for rural and urban areas was lower in every year than for India as a whole.[7] In 2006 Tamil Nadu had the lowest TFR of any Indian state at 1.8 (IIPS and ORC Macro 2008). While figures from different sources are not completely comparable, still the broad trend is unequivocal (Figure 2).

Figure 2: TFR, Tamil Nadu (urban and rural) and all-India, 1971-2008



[7] Data on total, urban, and rural TFR for Tamil Nadu and all-India from 1971-1998 are from RGI estimates (using Sample Registration System data) compiled by the National Commission on Population http://populationcommission.nic.in/birth.htm; data for subsequent years for all-India and all-Tamil Nadu are from Ministry of Health and Family Welfare estimates compiled by the National Planning Commission: www.planningcommission.gov.in/data/datatable/2803/tab_113.pdf

A key characteristic of this fertility decline is a "homogenization of the demographic regime" (Nagaraj 1999, 2000) starting in the 1970s and intensifying in the 1980s. Specifically, over time, fertility differentials have diminished between urban and rural areas, across districts, and across caste, religion and educational levels, perhaps more so than in other Indian states. For instance, while in 1971 rural Tamilian TFR stood at 4.2 and urban at 3.3, by 1998 (the last year for which we could find comparable urban-rural TFR data over time) rural TFR was at 2.1, almost the same as the urban TFR of 1.8. By the early 1990s, the TFR among even illiterate women was as low as 2.8, and among those educated through high school and above at 2.04; TFRs were virtually identical between Hindus, Muslims and Christians, and across low and other castes (Nagaraj, K., 1999), Table 4).

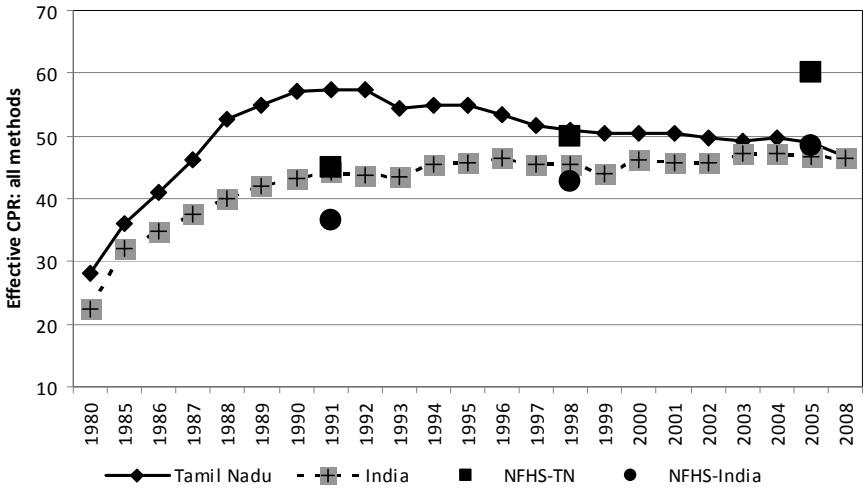
Drivers of the Fertility Decline

There is some debate about which demographic factors have contributed to this rapid and sustained fertility decline. Since most fertility in Tamil Nadu occurred within marriage, the decline could either be due to a rise in age at marriage Antony 1992; Krishnamurthi et al. 2005) or lower fertility after marriage. While the singulate mean age at marriage did increase from 18.4 years in 1961 to 20.5 years by 1992-93 (Antony, 1992; (Nagaraj, K., 2000) [8]), Nagaraj (2000) claims that this was not as significant a contributor as the decline in fertility within marriage from 5.9 in 1972 to 4.2 by 1992. Improvements in infant mortality, described earlier, likely also contributed to a willingness to bear fewer children.

There is less disagreement about the role of contraceptive use, which increased in the state throughout this period, rapidly from 34% in 1980 to 47% by 1993, and at a slower, but steady pace since then (Figure 3). Female sterilization and IUDs were the dominant methods and registered the largest increases in adoption (Antony 1992).

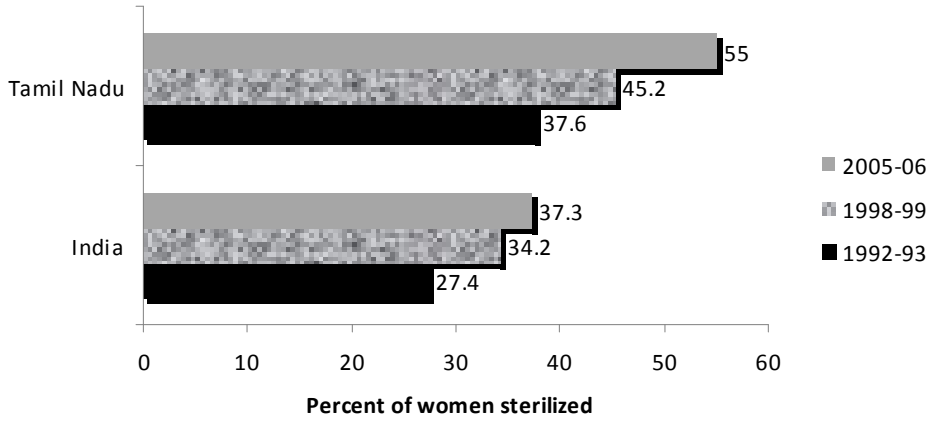
Figure 3: Effective Couple Protection Rate, Tamil Nadu and all-India

[8] The singulate mean age at marriage is a synthetic cohort measure. The period measures for actual age at marriage from the three rounds of the NFHS show that the mean age at marriage among women 20-49 years of age in 1992-93 was 18.3 years, and rose to 19.4 years by 2005-06 (IIPS and Macro, 1995, 2008).



At the same time, the family planning program, though effective, is regarded by several experts as not particularly women-friendly (KII: 3 senior program officers, 1 anthropologist; Van Hollen 1988; (Ravindran, T. K. & Mishra, U. S., 2001). For instance, female sterilization has dominated the method mix (Figure 4), more so than for the country as a whole, even after Tamil Nadu became the first state to drop sterilization targets in the early 1990s (Visaria, L., Jejeebhoy, S., & Merrick, T., 1999). Women who deliver in a public health facility often face heavy pressure to accept sterilization (if they already have two children) or IUDs (if they already have one child) (KII: 2 program managers; Van Hollen 1988). Several experts have commented on the limited options that a program with an overwhelming focus on sterilization poses for women in terms of choice and reproductive health safety (Van Hollen 1988; (Ravindran, T. K. & Mishra, U. S., 2001); Ravindran & Balasubramaniam 2004).

Figure 4: Female sterilization, India and Tamil Nadu



There is also general agreement about the political, social and economic drivers of the fertility decline. Several researchers posit that Tamil Nadu's fertility decline occurred despite, and possibly because, of a context of poverty (Visaria, L., 2009); (Savitri, R., 1994); (Krishnamoorthy, S., Kulkarni, P. M., & Audinarayana, N., 2005)). The state consistently contributed to raising aspirations in the general population through its strong commitment and sustained investment in establishing a modern welfare state, with free education at all levels, a subsidized yet strong public health sector, reservations for lower castes in educational and government institutions, and a successful noon meal program in schools (Ramasundaram, S., 1995); (Lindberg, S, Athreya, V, Vidyasagar, R, Djurfeldt, G, & Rajagopal, A, 2011); (Ravindran, T. K., 2009). These rising material and social aspirations in the face of poverty, researchers argue, propelled couples to adopt a norm of small families as a means to realize their aspirations with limited resources, thereby triggering the rapid fertility decline from the 1970s (Visaria, L., 2009); (Savitri, R., 1994); Krishnamoorthny et al 2005; Ramasundaram 1995; KII: 1 education specialist). After the early 1990s, rapid and sustained economic growth – despite persistent pockets of poverty (World Bank 2005) – raised aspirations even further, and likely contributed to sustaining and accelerating the decline in fertility towards replacement levels.

Finally, studies that examine links between individual-level indicators of women's achievement and fertility in Southern Indian states – including Tamil Nadu – do not find a significant relationship (Savitri, R., 1994); (Krishnamoorthy, S., Kulkarni, P. M., & Audinarayana, N., 2005); Jeejebhoy 1991). Yet, our previous analysis suggests that, at a societal level, gender relations have likely played a positive role in setting the stage for the rapid fertility decline, in the form of favorable kin practices, government investments in women's education, and the historically pro-women public policy environment from Periyar onwards.

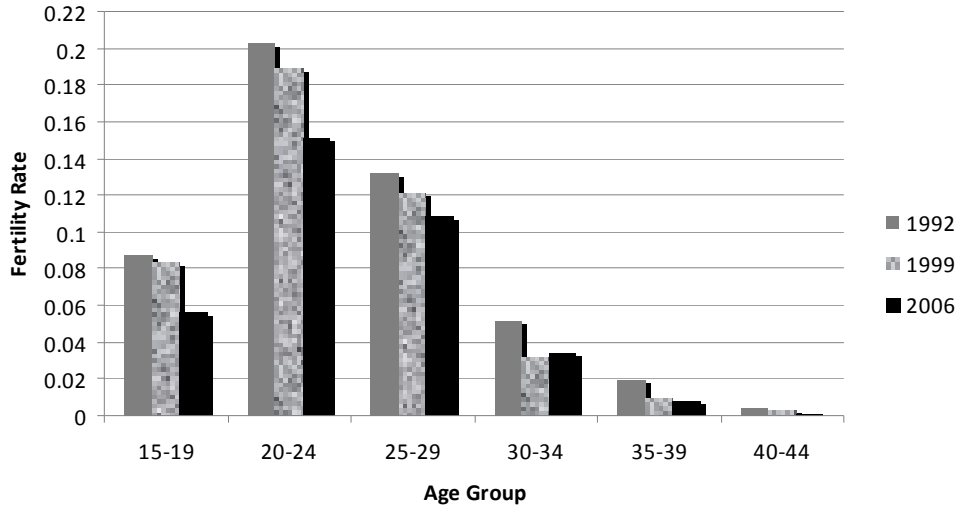
That baseline gender relations could have influenced fertility decline, which, in turn, is posited to influence gender relations, speaks to the complex bi-directionality of the fertility-gender relationship, echoing the discussion on complexity in demographic phenomena discussed in our Methods section. We incorporate this in our analysis of causal pathways from fertility decline to gender relations and women's lives by focusing, in the rest of this paper, on changes in gender-related outcomes at least 10 years *after* the major fertility declines of the 1970s. Still, we acknowledge and discuss also the implications for our conclusions of the bi-directionality of this relationship. We first discuss the proximate changes triggered by fertility decline that we posit influenced how women could take advantage of a lower fertility regime.

PROXIMATE CHANGES OF THE TAMILIAN FERTILITY DECLINE

Longer Proportion of Women's Lifespan without Childbearing

With declining fertility and lower female mortality, since the 1980s Tamilian women have experienced an increasing proportion of years not devoted to childbearing. First, young women are delaying childbirth, as evidenced by a combination of later marriage and no childbearing outside of marriage. While the majority of Tamilian women still do marry (only 11% of women age 20-49 remain unmarried) (IIPS 2008, table 29), they marry later. The proportion of unmarried women among 15-24 year olds has been rising since the late 1980s, and, by 2004, about two-thirds of women age 15-24 were unmarried across both urban (69%) and rural (61%) areas of the state. In addition, between 1992 and 2006 childbearing within marriage shrunk for every age group (IIPS 1995; IIPS and ORC Macro 2000, 2008). Finally, once started, women conclude childbearing quickly: age-specific fertility rates are fairly low for women in their early thirties and minimal beyond age 35 (Figure 5).

Figure 5: Age Specific Fertility Rate, Tamil Nadu



This decline in years spent in childbearing has been accompanied by declining mortality for Tamilian women that has matched or surpassed survival improvements in the country as a whole (Figures 6 and 7). The major cause of adult female mortality, namely maternal mortality, declined dramatically in the state, from 380 per 100,000 births in 1993 to 90 per 100,000 by 2007 (Padmanaban, P., Raman, P. S., & Mavalankar, D. V., 2009)). Women's life expectancy increased significantly, rising from 57.8 years in the period 1981-86 to 69.8 years by 2006 (WHO 2009). As

with fertility decline, mortality decline and life expectancy improvements span urban and rural areas, though some inter-district disparities remain.

Figure 6: Maternal Mortality Ratio, Tamil Nadu and all-India

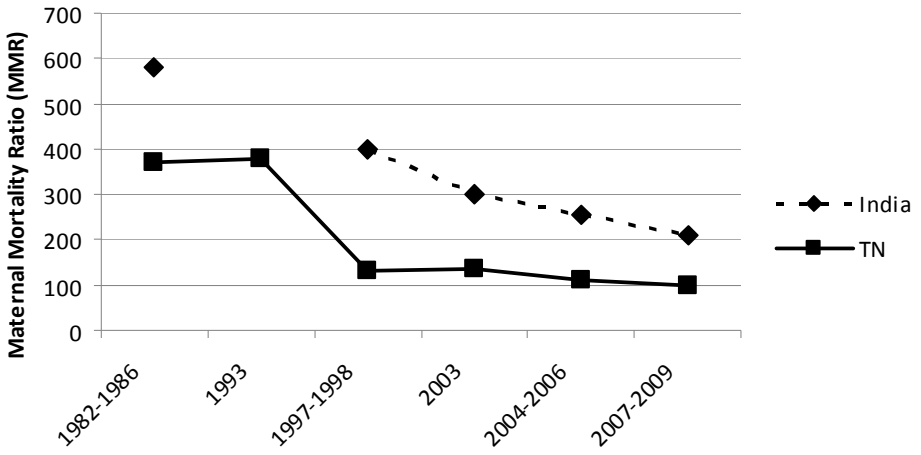
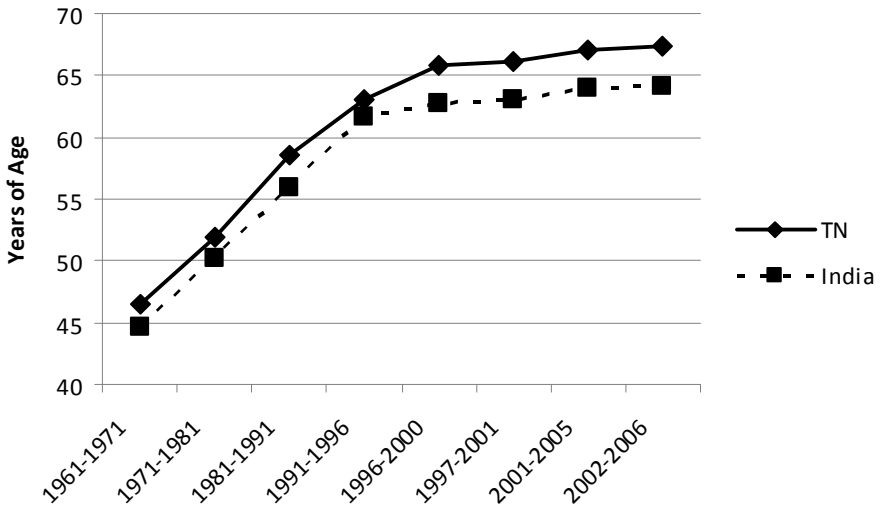


Figure 7: Female life expectancy at birth, Tamil Nadu and all-India



Thus, Tamilian women are more likely than ever before to live longer, marry later, survive childbearing, and devote fewer years to childbearing. This means that women have increasing time before they marry, and once childbearing is complete, to potentially spend on non-childbearing and childrearing domains of their lives, such as higher education or engagement in the labor force.

Change in Social and Economic Value of Children

Research on this topic is scant in Tamil Nadu. Still, our key informants and some qualitative research suggest that fertility decline has been accompanied not by a decrease in the social and economic value of children, but, rather, by a change in their value.

In an agricultural society, the number of children, particularly sons, was important for a family's economic status since children constituted valuable agricultural labor. In contrast, in present-day Tamil Nadu's modernizing economy, land and many sons are not as important a source of status and power (KII: 1 demographer, 1 program manager). Instead, high social status is accorded to a "modern" family, which denotes a family with low fertility and resultant fewer children who are highly-educated and employed in high-paying, high-status professions (KII: 1 anthropologist, 1 program manager; (Ravindran, T. K. S., 1999). Such children bring added social and economic value also by being more "marriageable" as young adults, and more able to marry into households with higher economic status, as education and employment become key criteria for marriageability for both men and women (Fuller, C. J. & Narasimhan, H., 2008).

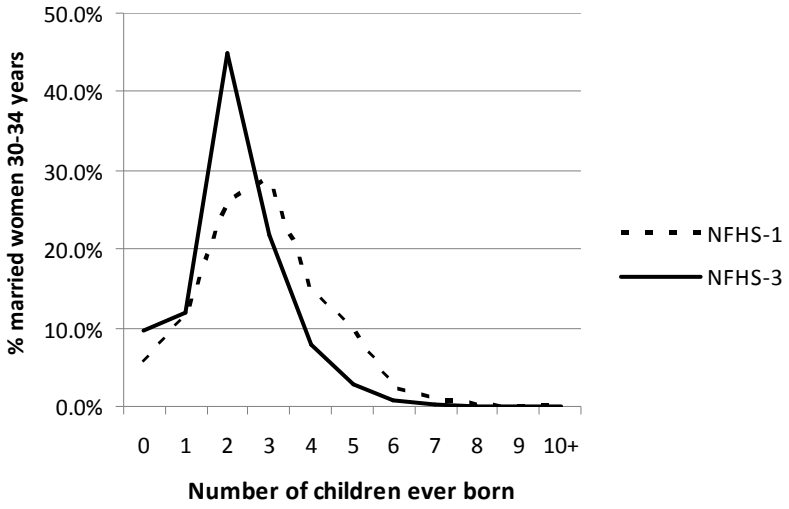
Thus, children still hold tremendous social and economic value and are an important component of family status in Tamil Nadu's rapidly changing society. The NFHS data for Tamil Nadu support this, insofar as the vast majority of women age 30-34 bear at least one child. Still, between 1991-92 and 2005-06, we also see an increase in the proportion of women in this age group -- 5.7% to 9.6% -- that has no children, perhaps indicating the beginnings of a social norm that accepts alternatives to motherhood.

Focus on Quality of Children

While the *centrality* of motherhood may not have changed, we argue in this paper that the *nature* of motherhood has shifted to emphasize the rearing of higher "quality" children.

There is some evidence for India as a whole that fertility decline has shifted parents' focus from quantity to quality of children (Mari Bhat, P. N., 2002), 2010). Data from the NFHS for Tamil Nadu between 1991-92 and 2005-06 indeed illustrate a shift away from quantity of children: the entire distribution of children ever born to women between 30-34 years of age shifted towards smaller families in this period (Figure 8).

Figure 8 – Children Ever Born to Married Women Ages 30-34, NFHS 1991-92; NFHS 2005-6



Several of our key informants argued that there has been a significant shift in Tamil familial norms from an emphasis on having many children to having fewer children but investing more heavily in these children (KII: 2 demographers, 2 program managers, 1 anthropologist). Informants also posited that the relationship between quality of children and fertility has operated in both directions. Rising aspirations and the desire to raise child quality contributed to fertility decline, as parents wanted fewer children so that they could invest more in each one. Conversely, once fertility began to decline, parents were able to realize their aspirations for higher quality as a result of having fewer children in whom to invest.

This phenomenon has specific implications for parental investment in daughters. On average, lower fertility results in smaller families. Smaller families, in turn, mean that the size of the kinship group begins to shrink across generations. As a full generation begins to have not only fewer siblings, but also fewer uncles, aunts, and cousins, girls may need to spend less of their time looking after relatives, which could potentially free them up for schooling (Bhatla, N., Duvvury, Nata, & Chakraborty, S., 2010). In this situation daughters are more likely to have the time and social approval to benefit from parental aspirations for higher quality children. This, in turn, is likely to trigger increased investments in daughters, particularly in education (KII: education specialist). However, it is also possible that these dynamics may not result in *equal* increases in investments for daughters and sons. For example, Schultz (2007) cites several studies from Korea that find that

even when sex differentials in children's schooling and health care diminish, overall maternal care of sons is greater than of daughters.

How these relationships between fertility and the proximate changes triggered by its decline influence gender inequality, women's lives and gender relations is likely to vary by context. Below we explore these dynamics in more detail.

RELATIONSHIPS BETWEEN FERTILITY DECLINE AND GENDER OUTCOMES

We first examine the changes in our outcomes of interest, namely the extent to which there is greater investment in girls; greater participation by women outside the home; and changes in social norms. For each outcome, we then analyze how these shifts are likely to be related to fertility decline and its proximate changes, Tamil Nadu's socio-economic development, and the interplay between these two sets of forces. Unless otherwise noted, the data below are authors' calculations from NSS data accessed through the IPUMS database.

Greater Investment in Girls

A less masculine sex ratio following on fertility decline would suggest that parents are more willing to "invest" in allowing a daughter to be born and to survive early childhood, while higher levels of – and lower gender inequality in – post-secondary schooling for girls would suggest that parents invest more in the daughters they have. These changes may occur because contextual conditions and economic prosperity make it more feasible to invest in daughters, while social and gender norm changes make it more attractive to do so.

Shifts in sex ratios

Evidence on the relationship of declining fertility with son preference and adverse sex ratios in Tamil Nadu is equivocal. On the one hand, after the period of most rapid fertility decline, from 1976-1981, expressed son preference declined among Tamilian women from 11.5% of mothers wanting more sons than daughters in 1992 to 5.7% in 2006. Shifts in actual family sex composition mirrored the shifts in ideal sex composition preferences: the proportion of young women with equal numbers of sons and daughters in this period rose from 22% to 30%. Even more notable, the proportion with only daughters increased from 14% to 18%. These patterns in children ever born held across all age groups, and rural and urban areas (IIPS 1995; IIPS & ORC Macro 2007).

During the same period, however, while the sex ratio at birth (SRB) remained noticeably less masculine than for India as a whole, it did not improve as may have been expected given the decline in reported son preference and changes in family sex composition (Table 1). Further, the state's child sex ratio (CSR), rather than improving, became more masculine (Table 2). In fact, this trend started as early as 1951 (Bedi, A. S. & Srinivasan, S., 2009), even before the fertility decline, with certain districts showing particularly adverse sex ratios.

Table 1: Sex Ratio at Birth (females/1000 males born) – India and Tamil Nadu

Year	Source	Tamil Nadu	India
From the Sample Registration Survey and Census records			
1981-90	SRS[1]	952	909
1996-98	SRS[1]	952	909
2001	Census[1]	935	909
2001-03	SRS[2]	953	883
2006-08	SRS[2]	936	904
2011	Census[3]	946	--
From the NFHS, for the five years preceding the survey[4]			
1987-8 to 1992-3	NFHS-1	1021	951
1993-4 to 1998-9	NFHS-2	946	935
2000-01 to 2005-06	NFHS-3	930	920

Notes:
[1] From Srinivasan and Bedi, 2009
[2]From UNFPA 2010, http://india.unfpa.org/drive/SRBBooklet.pdf
[3] Reported in The Hindu, http://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/article2922481.ece
[4] Ramaiah et al., 2011, http://www.socialsciences-ejournal.org/5.10.%20Chandrasekharayya.pdf

Table 2: Child Sex Ratios by Year (girls/1000 boys 0-6 years) – Tamil Nadu and India

	1961	1971	1981	1991	2001	2011
Tamil Nadu	985	974	967	948	942	946
India	976	964	962	945	927	914

Sources: Census data. Data for 1961-2001 from Srinivasan and Bedi 2009; data for 2011 from Ramaiah et al., 2011.

This pattern in the sex ratios at birth and early childhood likely reflects some "intensification" effect of Tamil Nadu's fertility decline (Das Gupta & Bhat 1997). Specifically, it may be the case that those who still wanted sons or who wanted one son in their two-child family increasingly resorted to sex-selective abortion or neglect of girls leading to excess female child mortality. The most recent figures, for 2011, suggest that this intensification effect may be stabilizing and sex ratios coming

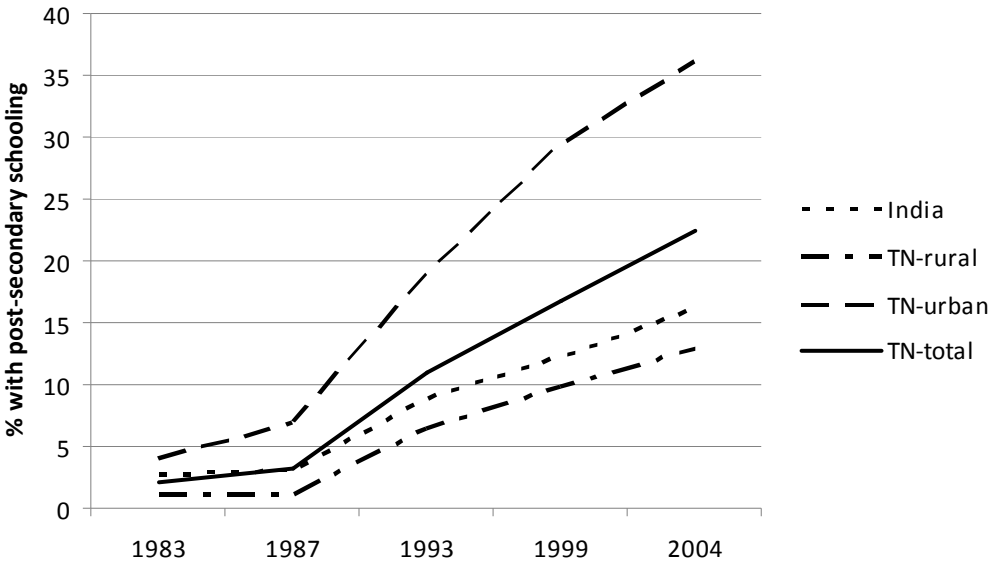
more in line with recorded sex preferences for children, even in particularly discriminatory districts (Srinivasan & Bedi 2011).

Shifts in post-secondary schooling

We examine the trends in post-secondary schooling achieved by young women currently ages 20-29 years. We focus on post-secondary schooling on the assumption that, unlike primary education, higher levels of schooling require deliberate and significant parental investment in daughters as they enter young adulthood. Also, post-secondary schooling is likely to be a foundation for income earning opportunities that could improve women's lives and gender relations in other ways. We choose this age group because it comprises women in their prime reproductive years that can be expected to have had recent, full exposure to the likelihood of higher schooling opportunities.

The trends in post-secondary schooling between 1983 and 2004 show a distinct shift in parental educational investment in their daughters. In 1983 only 2.1% of young women had completed post-secondary levels of schooling in Tamil Nadu, very similar to all-India levels. By 1993, the proportion of women completing post-secondary schooling had increased five times the level in 1983 to reach 10%. In this year, 12-17 years after the most rapid phase of Tamil Nadu's fertility decline (1976-81), Tamil Nadu had surpassed all-India levels of girls' post-secondary schooling. By 2004 almost one-quarter of young Tamilian women had post-secondary schooling (22.4%). Urban-rural differentials persist, however and, as recently as 2004, Tamil Nadu's urban post-secondary schooling was still higher than in rural areas, though rates of increase have been faster in rural than urban areas (Figure 9).

Figure 9: Post-secondary schooling, women 20-29 years, Tamil Nadu and all-India



Recent trends indicate that young women in Tamil Nadu also are entering technical fields of education. Since India's economic liberalization in 1991 there has been a strong emphasis in Tamil Nadu on technical education, resulting in higher enrolments of women in fields such as science, engineering and commerce compared with much of the rest of India. For example in 1995-96, the percentage of women engineering and architecture college students was 21% in Tamil Nadu, the 2nd highest in the country (Chanana, K., 2000). In general, young women's enrollment in Arts and Sciences Colleges that host such programs has increased since the 1980s. In 1978-79, less than one-third of girls (32.4%) enrolled in college programs were in Arts and Sciences Colleges. By 2000-01 half of all such girls were enrolled in these colleges.[9]

Improvements in schooling have percolated also to the lower castes in the state. Perhaps at least in part due to Tamil Nadu's longstanding, strong social movement to empower Dalits, and its programs of affirmative action for higher education for these groups, by 2003 89% of SC/ST[10] students were enrolled in primary school and 87% in upper primary (Times of India 2003). In

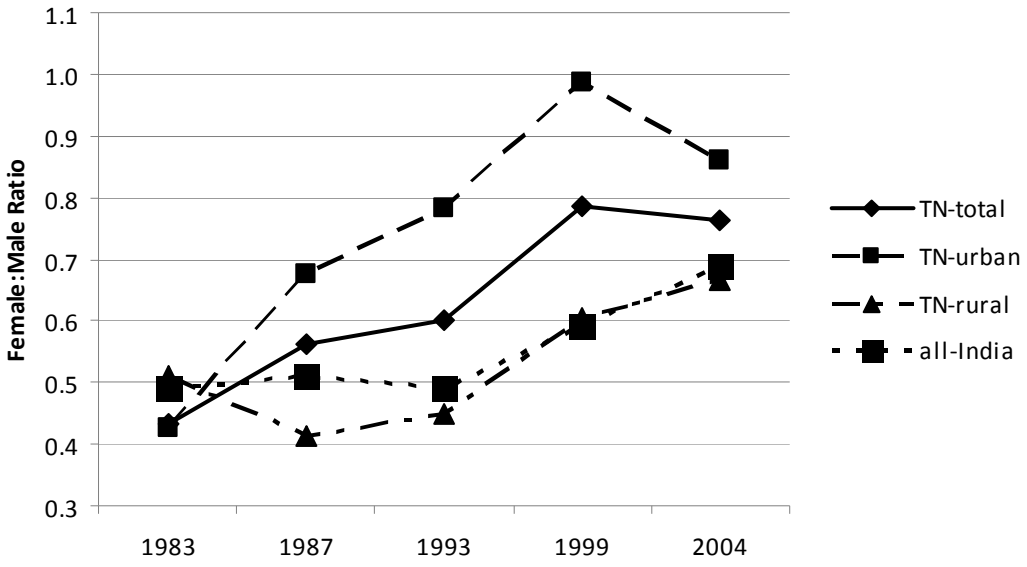
[9] Table 10.19 Tamil Nadu State Development Report (2005), http://planningcommission.nic.in/plans/stateplan/sdr/sdr_tamil.pdf

[10] Scheduled Castes and Scheduled Tribes (SC/ST) are two groups of especially disadvantages peoples – typically lower castes – which are given special recognition in India's Constitution and in government social and economic programs.

higher education, Tamil Nadu is among the top 4-5 states in representation of SC/ST women in disciplines such as engineering and medicine (Chanana, K., 2004).

Gender inequality in higher schooling has also started to diminish, with the female to male ratio shifting in favor of women. In 1983, young men were more than twice as likely as young women in the same age groups to have post-secondary schooling; by 2004 they were only 30% more likely (Figure 10). Still, even though Tamil Nadu is now closer to achieving gender equality in post-secondary schooling than the country as a whole, schooling in some fields – such as technical degrees -- remains a rarity for young women relative to young men. Despite young women's gains in the state, in 2001 only half as many young women as men in urban, and even fewer in rural areas, had a technical undergraduate or graduate degree (Swaminathan, P., 2008).

Figure 10: Sex ratio of post-secondary schooling, Tamil Nadu and all-India



Role of fertility decline and proximate determinants in observed shifts in investment in girls

Our analysis of investment in girls supports the contention that the shift in focus from quantity to quality of children has contributed to greater investment in children, albeit not on all fronts. For instance, we find that sex ratios in birth and early childhood became more masculine until the early 2000s, even though expressed son preference declined. On the other hand, fertility decline and the resulting emphasis on quality of children have been unequivocally accompanied by a notable rise in higher education for girls. Still, there remains a substantial gender gap in higher schooling in technical fields.

Continuing gender inequality in technical – and thus, presumably, career-oriented – education despite overall higher levels of post-secondary schooling for girls may reflect the nature of the motivations for investing in daughters. Some research suggests that while the shift to quality of children may have improved girls' welfare, families have yet to fully break out of the patriarchal mold of preparing girls for marriage. For instance, respondents in one study considered education an important part of making a young woman more adept at motherhood and housekeeping (Ravindran 1999), and more capable of providing necessary input into her children's education and the family's social status (Fuller, C. J. & Narasimhan, H., 2008). One of our key informants noted: "…now a prospective bride is valued not on how she can cook but whether she can teach children the alphabet" (KII: 1 demographer).

There is some inkling of change, however: the same respondents in Ravindran's (1999) study who considered education as necessary to become a "good wife" also want their daughters to be educated so that they can earn and not be as dependent on or subservient to their husbands as their mothers. The growing *number* of women graduating from engineering and professional colleges – despite the drag in closing the gender *gap* in graduation from these fields -- does reflect that these young women and their families aspire for them to be earners both before and after marriage (Fuller, C. J. & Narasimhan, H., 2008); (Chanana, K., 2004).

Contextual conditions have also played a role in the growth of higher education for girls and young women. First, the state continued to invest in higher education, and there was a doubling of the number of institutions of higher education[11], creating a supply to meet rising demand. Second, Tamil Nadu's tremendous economic growth since the latter half of the 1980s heightened the potential for increased returns to higher and more technical schooling. A World Bank report (2005) notes that by the early 1990s Tamil Nadu's economy became one of the fastest growing in the country, and achieved levels of poverty reduction in both urban and rural areas that surpassed poverty reduction averages for India as a whole. Despite pockets of continuing poverty, Tamil Nadu's per capita income ranked the third highest in the country by the 1990s, enabling parents to invest more in the quality of their children, including daughters.

[11] Tamil Nadu State Development Report (2005), Table 10.19; http://planningcommission.nic.in/plans/stateplan/sdr/sdr_tamil.pdf

Greater Participation Outside the Home: Female Labor Force Participation[12]

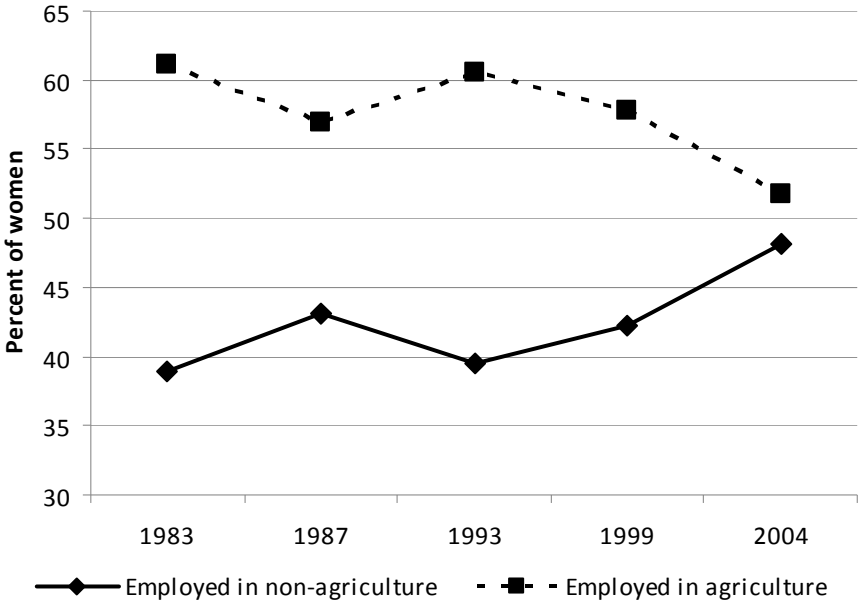
Women's work is frequently under-reported and under-enumerated in the literature. This is definitely the case in India, for multiple reasons. First, women are more likely than men to undertake part-time work, or work seasonally, and so surveys measuring full-time labor force participation tend to underestimate women's employment (Das 2006). Another key reason is because so much of women's work can be home-based and not monetized (Rustagi 2003; Das 2006; Jose 2007). A time-use survey conducted in Chennai city found that women spend a considerable amount of their time in home-based production of nonmarket goods and services (Malathy 1994). Finally, the multiple surveys that provide data on female labor force participation use varying definitions and arrive at different estimates of women's participation in the labor force. Thus, our discussion of women's employment is necessarily limited and conclusions cautious.

Female labor force participation in Tamil Nadu has been rising since at least the 1980s. NSS data show that in 1983 slightly more than one-third of Tamilian women ages 20-39[13] (39%) were employed. Between 1983 and 2004, the percent of employed women in this age group rose to 51% while the percent of women who reported that they were unemployed halved, and those whose main activity was "housework" declined from 54% to 43%.

Among employed women, the distribution between those in agriculture and those in non-agricultural sectors has shifted from a majority in agriculture to about equal proportions of employed women in both sectors. The proportion employed in agriculture declined from 61% in 1983 to 52% in 2004 while the proportion who reported their principal activity as non-agricultural increased by more than 50%, from 15.2% to 24.7% (Figure 11). While disaggregating the available NSS data is difficult due to small sample sizes, nonetheless the overall trends suggest that these changes have occurred across urban and rural settings. In fact, in rural areas Tamil Nadu ranked among the top five states in the country for rural women's non-agricultural employment even in the 1980s ((Unni, J., 1990).

[12] Unless specifically noted otherwise, the data below are from analyses conducted with NSS and reported in the IPUMS study.
[13] We choose to focus on women age 20-39 as these are the prime reproductive years when changes in fertility and resulting proximate factors are most likely to have an impact on women's lives.

Figure 11: Proportion of Employed Women (20-39 yrs) in Agriculture vs. Non-Agriculture



Between the 1960s and 1980s, much of the movement from agricultural to non-agricultural employment may have been due to growing casual or informal labor (Unni 1988), and thus unlikely to be particularly welfare-enhancing – much less empowering – for women. From the early 1980s we see a change, with data showing greater women's participation in market-based manufacturing and services.

Notable employment differentials exist by women's residence, age and education. In every year for which we have data, rural women are more likely to be employed than their urban counterparts. In urban areas, older women (30-39 years) are more likely to be employed than younger women (20-29 years): urban young women's employment rates moved slightly from 23% in 1983 to 28% in 2004, compared with a 13-percentage point increase for urban women aged 30-39 from 29% in 1983 to 43% in 2004. While school attendance may explain part of this difference between age cohorts, the proportion of young women 20-29 years old currently in school does not exceed 2% in any year for which data are available. Finally, less educated women (those with less than primary education) are twice as likely to be employed than are more educated women (those with post-primary education). This is true for all time periods: in 1983, 46% of uneducated women and 24% of post-primary educated women were reported as employed, while by 2004 these proportions were 68% and 36% respectively.

The gender gap in employment is improving in favor of women, albeit slowly. While in 1983, men age 20-39 were more than twice as likely to be employed than were women, by 2004 the male to female ratio for employment dropped to 1.76. In 1983 men were more than three times as likely as women in the same age group to be employed in non-agricultural sectors, whereas by 2004 men were 2.5 times more likely.

Role of fertility decline and proximate determinants in observed shifts in female labor force participation

The evidence suggests that by 2004 Tamilian women were more likely to be employed and more likely to work in non-agricultural sectors, than in previous decades; the gender gap has also started to decline. Part of the explanation for the rise in female employment is likely women's longer lifespan without childbearing. The desire to earn a higher total family income to realize growing aspirations for children, for which we presented evidence in an earlier section, is likely a strong motivator for the shift towards non-agricultural fields of employment. Finally, the broader policy environment is important to consider in explaining this leap in women's employment, the shift out of agriculture and the decline in the gender gap in employment. Women's ability to gain a foothold in the non-agricultural workforce has been realized, in part, by the economic structures, educational system, and development initiatives in place over the last decade and a half, such as the expansion of the information-technology sector, an option especially attractive to recent cohorts of young women whose families invested in their technical education (KII: 1 anthropologist, 2 senior program officers, 1 economist).

The influence of the rise of women's employment in non-agricultural fields on gender relations is equivocal. On the one hand, the shift out of agriculture could mean increasing opportunities in professional sectors for the increasingly educated young women of the state. On the other hand, it is possible that women enter and stay at the bottom rungs of low-skill manufacturing or service industries, continuing a necessity-related rather than opportunity-related pattern of employment. It is also possible, however, that even this low-skill work represents a "social opportunity, by providing women the opportunity to leave the home and be exposed to new ideas, non-family institutions and social networks. This exposure, in turn, may eventually influence gender relations. Though the data do not allow for such detailed analysis, some research notes that such an influence may be at play, triggered by an increased intermingling of men and women in economic and social spaces (Anandhi, S., Jeyaranjan, J., & Krishnan, R., 2002). Already, even in areas that have not seen increases in women's education and employment, qualitative research shows that, compared to

their mothers, younger married women are more assertive and vocal in matters such as male violence (Ravindran, T. K. S., 1999); KII: 1 education specialist).

Yet, the fact that more educated, urban, younger women – who likely have the lowest fertility levels – are *less* likely to be employed outside the home than are older, less educated, rural women suggests the need for caution in interpreting what gains in female labor force participation mean for women's lives and gender relations. These patterns could signal several possible dynamics at work. First, rural, older and less educated women's motivation to work may be driven more by poverty than the expansion of economic opportunities for women, thus signaling compulsion rather than any change in gender relations or career prospects for these women.

It is also possible that younger women are unable or unwilling to take advantage of opportunities because gender roles inside the home have not transformed in ways to give women "real" time to explore these opportunities. Specifically, the increased importance of high-quality children that has accompanied fertility decline seems to motivate – or compel -- young, educated, urban women to increasingly stay home to invest more time in their one or two children rather than to join the workforce (KII: 1 anthropologist, 1 demographer). A time-use study of women in Chennai in the late 1980s finds, for instance, that women's higher education is associated with a decline in all non-market activities except teaching the children, suggesting a huge reallocation of time for better educated women (who are also likely to be from wealthier families and have lower fertility) towards investment in their children (Malathi 1994). Anthropological studies in other parts of India have drawn similar conclusions (Olsen, W. & Mehta, S., 2006). This pattern is consistent with our earlier finding that education is considered important for young women not necessarily as a prelude to better employment but, rather, to better marriageability and mothering. Thus, the fact that older women are more likely to be employed suggests that women are able to take advantage of a longer lifespan without childbearing to explore non-domestic roles only *after* they have first fulfilled their still-primary responsibility for childrearing.

When young women do work, the increase in aspirations for children may, in fact, combine with women's responsibility in childrearing to create a "double burden" of simultaneous reproductive and productive work. Specifically, young couples likely feel added pressure to increase their household income as aspirations and desired investments in children rise, and thus young women might work outside the home *while also* taking responsibility for child quality (KII: 1 anthropologist, 1 program officer, 1 education specialist). Finally, better employment opportunities

may contribute to the persistence of violence against women as men react to women's changed opportunities within a largely unchanged normative structure defining women's roles (Srinivasan, S., 2005); (Kapadia, K., 1997); (Anandhi, S., Jeyaranjan, J., & Krishnan, R., 2002); KII: 1 program manager). We explore the nature of changes in social norms around marriage, dowry and violence below.

Shifts in Social Norms

Our analyses thus far suggest that, in the case of Tamil Nadu, fertility decline has not been accompanied by a decline in the social and economic value of children. Instead, we see a change in the definition of "high value" children. As a consequence of the continuing importance of children to the family, motherhood does not appear to be any less central to norms of femininity, even as women are increasingly educated and work outside the home. Rather, the nature of women's customary responsibilities may have changed. Below, we examine whether these patterns have been accompanied by any shift in gender relations as reflected in marriage norms, dowry practices, and the prevalence of intimate partner violence.

Marriage and dowry

By the second half of the 20th century Tamil Nadu's Southern kinship and marriage systems began to change among non-Brahmin groups in a process referred to as "Sanskritization," in other words, these groups began to emulate Brahmanic customs more akin to Northern Indian kinship and marriage norms. Consequently, the incidence of cross-kin marriages began declining. Also, the custom of dowry started to become more popular and increasingly onerous (Heyer, Judith, 1992); (Srinivasan, S., 2005). Moreover, despite increasing education and employment outside the home and even outside the village, the social code on controlling girls' sexuality before marriage has remained largely unchanged (Ravindran, T. K. S., 1999); (Kapadia, K., 1993); (Anandhi, S., Jeyaranjan, J., & Krishnan, R., 2002)). Finally, despite a rising age at marriage, increasing aspirations for higher schooling and a career for daughters, a good marriage is still seen as key for young women's lives (Kapadia, K., 1993); (Srinivasan, S. & Bedi, A. S., 2007).

These shifts, veering towards the more patriarchal Northern kinship and marriage norms, would suggest that social norms are becoming more restrictive towards young women. Yet, other changes signal the beginnings of some relaxation in marriage norms. Recent qualitative data find that in some – though not by any means all – communities there is an increase in "companionate" marriages (Fuller, C. J. & Narasimhan, H., 2008), marriages in which parents arrange a match but

the prospective bride and groom's opinion is sought, and also love marriages. Research from a large survey of Tamilian youth conducted in 2006-07 found that only 7% of young married women (age 15-24) and 5% of young married men (ages 15-29) reported having a marriage where they had no say at all, whereas 55% and 44% of young married men and women, respectively, had been consulted and had met their potential spouse, and a full one-fifth had selected a spouse independently of their parents (Jejeebhoy et al. 2009).

Some anthropological research points also to a rise in nuclear households consistent with declining fertility and urbanization (Fuller, C. J. & Narasimhan, H., 2008). In such households, a young woman is more likely to be engaged in household decisions with her husband and less likely to have to accept decisions made by others. Ravindran's (1999) study, which finds that men are starting to spend more time with wives and children rather than outside the home, suggests that childrearing may also be moving towards a gender-egalitarian partnership.

Intimate partner violence

Consistent, reliable data on intimate partner violence in Tamil Nadu are not available for the full period of our analysis, but several studies find that Tamil Nadu has persistently high levels of intimate partner violence perpetrated against women. A 1996 study in two blocks of the state found that 36-38% of surveyed women had been beaten by their husbands (Jejeebhoy, Shireen J., 1998). Men and women participating in a qualitative study in Chennai slums in 2000-01 reported that in "…most marriages conflicts often resulted in verbal, physical, and sexual violence against the wife" (Go, Vivian F. et al., 2003). A mixed methods study in the late 1990s in a village close to Chennai found that over 40% of men in the study – Dalit and non-Dalit – had been physically violent towards their wives (Anandhi, S., Jeyaranjan, J., & Krishnan, R., 2002). Data from the NFHS-2, also from the late 1990s, show that Tamil Nadu has some of the highest rates in the country of intimate partner violence: 36% of currently married Tamilian women age 15-49 reported having been beaten or physically mistreated by their husband since age 15, compared to 19% for India as a whole (IIPS and ORC Macro 2000; Table 3.16). While definitions across surveys are not entirely comparable, still the NFHS-3 data from 2005-06 show that Tamil Nadu continues to have much higher rates of physical spousal violence against women (41.9%) than the country as a whole (35.1%). In fact, Tamil Nadu is one of 7 states – and the only southern Indian state – with rates of intimate partner violence against women above 40% (IIPS and ORC Macro 2007; Table 15.14).

Role of fertility decline and proximate determinants in observed shifts in social norms

Rising aspirations and the central role of high-quality children in achieving these aspirations, both of which have triggered and accompanied the Tamilian fertility decline, have clearly contributed to the shift of marriage systems from more gender egalitarian Southern ones to less gender egalitarian Northern patterns. As education and employment take the place of kin membership as the key criteria for marriageability (Fuller, C. J. & Narasimhan, H., 2008; Fuller, C. J. & Narasimhan, H., 2008), marriage is seen less as a way to strengthen kin ties and more as an avenue to strengthen social or economic upward mobility (Heyer, Judith, 1992); (Nagaraj, K., 2000); Srinivasan 2004; (Kalpagam, U., 2005); Dharmalingam 2005; (Bedi, A. S. & Srinivasan, S., 2009). Increasing investments in both daughters and sons have further contributed to these changes. For example, parents who have invested in their daughters' education seek more educated grooms who can ensure a comfortable life for their daughters, regardless of kin membership (Banerjee, K., 1998). Parents of educated sons with non-agricultural jobs seek brides who are also educated, rather than brides from the same caste or kin group.

The spread in Northern marriage norms from Brahmanic to non-Brahman castes has likely been tied also to the social and political mobility, specifically of lower castes, that has come about through the Tamilian state's longstanding policies aimed at disadvantaged groups. With the state's investment in Dalits and other lower castes, these groups have increasingly aspired to attain upward mobility (Kapadia, K., 1993) by emulating the higher castes. This emulation has included lower fertility, higher female schooling and work opportunities, and changes in marriage practices. Some researchers note that this upward mobility has also been accompanied by an increase in control over women's sexuality and mobility, a higher value of women's chastity, and an adoption of more traditionally patriarchal notions of masculinity and femininity that are characteristic of the more traditionally patriarchal upper castes to whose status Dalits and other lower castes may aspire (KII: 1 anthropologist; (Kumar, P., Dagar, R., & Puri, H., 2004).

The rise in dowry has many of the same antecedents, grounded in the higher aspirations of individuals in a growing economy with a low fertility regime. Families of sons in whom they have invested an education seek a return on this investment in the form of a larger amount of wealth (or dowry) when marrying their sons. Also, the tendency of educated young women to stay home as part of the greater household investment in children has meant that such brides may no longer be seen as bringing in any income, thus heightening a demand for dowry as a source of alternative wealth (Bhat, P. N. Mari & Halli, Shiva S., 1999); (Banerjee, K., 1998), 1999). The decline in

endogenous marriages has also been highlighted as a contributor to higher dowry as households compete to get the most eligible groom regardless of kin status (Nagaraj, K., 2000). Even in some rural areas where young women are not highly educated or employed dowry is on the rise (Heyer 1992). Dowry is also increasingly associated with higher social status, and thus lower castes that traditionally did not demand a dowry are now increasingly doing so (Heyer, Judith, 1992); (Ravindran, T. K. S., 1999); Srinivasan 2005).

Finally, researchers note that the persistence of intimate partner violence may also, at least in part, be due to the same patterns described above. The increase in women's employment opportunities has contributed to greater self-confidence, assertiveness, and financial independence among young women (KII: 1 education specialist, 1 program manager; Anandhi et al. 2002). Experts argue that, while possibly empowering women financially, such opportunities present a challenge to male ideals of masculinity, which, in turn, contributes to the very high rates of violence against women in the state (Kapadia, K., 1997); (Anandhi, S., Jeyaranjan, J., & Krishnan, R., 2002).

CONCLUSIONS

In this paper, we explore the relationship between Tamil Nadu's shift to a low fertility regime from the 1970s, and subsequent changes in women's lives, gender inequality and gender relations. We tease out causal pathways through which the proximate changes from fertility decline can influence gender outcomes, and the role of the historical, socio-economic and policy context of the state. We find that fertility decline has likely contributed to many changes in women's lives, gender inequality and gender relations in Tamil Nadu post-1980s, but that the nature, speed and consequences of these changes vary by domain of inquiry. The context of the fertility decline also has been critical.

Tamil Nadu presents an example of a "baseline" context conducive to fertility decline, with a history of social and political activism and relatively egalitarian "Southern" kinship norms. The combination of a rapid decline in fertility and a strong public health system triggered Tamil Nadu's first significant drop in maternal mortality from 1982. High social aspirations in a struggling economy fed into fertility decline; in turn, with fewer children, parents were able to invest more in each child, including daughters. The parental desire to invest in children coincided with state investment in technical and other forms of higher education to contribute to the observed growth in female higher-secondary and technical schooling, which surpassed all-India levels in 1993. A spurt in economic growth from the early 1990s, a rise in industries that sought to hire women, a larger pool of educated young women, and more time available to women because of a longer

lifespan without childbearing likely contributed to the observed increase in women's non-agricultural employment. The beginnings of shifts in marital norms likely contributed to the observed rise in delayed marriage, companionate marriage and nuclear households. The turning point for many of these changes seems to have been between the late 1980s and early 1990s, about 10 years after the state's fertility started its sustained decline and a few years after Tamil Nadu reached replacement levels.

At the same time, other aspects of the fertility decline and the context in which it occurred likely contributed to less sanguine changes. The rising aspirations of formerly-disadvantaged groups and the key importance of high-value children in attaining these aspirations has meant that a decrease in women's time spent in child*bearing* is accompanied by a rise in the intensity of child*rearing*. Data showing that younger, educated women are less likely to be employed than are older, less educated women is consistent with this interpretation. It also means that while young women may theoretically have time to explore increased education and employment opportunities outside of the home, they appear to do so still within the patriarchal context of fulfilling first the responsibilities of marriage and motherhood. Among women who do work, anecdotal evidence suggests a "double burden," wherein work outside the home is added to – not a substitute for – their customary responsibilities. The increased investment in children has likely contributed also to the ongoing shift to the more patriarchal Northern system of marriage across castes that had earlier followed the less patriarchal Southern system. Increased expectations from sons in whom parents have invested may be associated with the observed spread of dowry across areas and castes that did not formerly practice dowry. Increased economic opportunities for women and the rise of nuclear households where there are no other mediating adults may partly explain the persistence of intimate partner violence against women.

Our paper is the first, to our knowledge, to use multiple types of primary and secondary data to analyze potential causal pathways for relationships between fertility transition and gender outcomes over a long period of time in one geographic area, and, in particular, to explore the critical role of other contextual factors in this relationship. We have used an eclectic combination of methods and sources of data, as recommended by recent literature on causation in relation to complex demographic phenomena. We cannot conclusively attribute changes in gender outcomes to fertility decline, largely because of a lack of suitable data. Still, in line with the literature on such causal analyses, we posit that our paper increases understanding of causal mechanisms between

fertility, gender outcomes, and the context in which these occur, and, as such, generates useful input for policy discussions or interventions.

An important implication of our findings is that we cannot assume that fertility decline by itself will necessarily improve women's lives or – even more important – change gender inequality or gender relations. Rather, policymakers and programmers need to deliberately strive to create a social, economic and political environment that is conducive to women being able to take advantage of the longer lifespan without childbearing offered by fertility decline and improved survival. Key policy investments to do so might include a focus on safe and accessible higher-educational opportunities and career-oriented employment options for the young women who have the time to invest in these, for themselves and their daughters.

At the same time, expectations of women's roles and responsibilities within the domestic sphere need to change for women and girls to take full advantage of fertility decline and opportunities outside of the home. In the absence of such shifts, we may see women's welfare enhanced (for instance in higher education levels) but fertility decline may not be necessarily transformative for women's lives overall (for instance in the case of violence or dowry). Our case study of Tamil Nadu illustrates that conditions and opportunities may, in fact, increase women's burden if their customary roles are unchanged but other roles are added to increase household welfare. It may be tricky, however, to find policy levers to change customary roles. After all, women are largely the primary caretakers of children the world over. Still, policymakers could address women's potential double burden by supporting policies encouraging family-friendly industries that recognize this burden. Also, they could address certain aspects of detrimental gender relations by enacting and enforcing laws against intimate partner violence and dowry payments.

Our paper focuses on changes specifically for women as fertility declines. However, a fuller exploration would ideally include also an analysis of changes for men. Such an analysis may find, for example, that while women appear to shoulder a double burden, in certain contexts men are more involved in childrearing than in the past, for example because the demands of investment in children have increased. Thus, perhaps both men and women face a double burden that policymakers need to address. This is an area with particularly limited research, and that would benefit from more attention.

In conclusion, the last three decades have been witness to many changes in women's lives, gender inequality and gender relations in Tamil Nadu, triggered by rapid fertility decline in a context of

deliberate state investment in public health, social development and economic growth. There is clearly a tension between the positive shifts in women's lives and gender equality in schooling and – to some extent – in economic opportunities on the one hand, and the continued pull of patriarchal gender relations in the spheres of marriage, dowry and spousal violence on the other. This tension may well move towards a more gender equitable equilibrium as the full implications of fertility decline are realized over the longer term. Policymakers could assist this process by ensuring women-friendly education and employment opportunities, and enforcing legislation in actionable spheres of domestic gender relations.

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