FERTILITY VARIATION IN ANDHRA PRADESH –
The role of mass media exposure

Author: Martin Ståhlgren
Supervisor: Sten Widmalm
Abstract

The southern Indian state Andhra Pradesh has today among the lowest fertility rate among all the major Indian states (1.8 children per woman). In recent years some studies has point to the role of mass media exposure in lowering fertility in Andhra Pradesh. Questions have been raised, however, about the nature and interpretation of this evidence. This study attempts to address this issue by examining the determinants of fertility variation in Andhra Pradesh in a multivariate framework, using Sub-district-level data from census 2011. However, to provide a deeper understanding of how mass media may have shape people’s views and opinions about childbearing, a comparative case study has also been carried out. The study’s result shows that mass media exposure emerges as the most important factor explaining fertility variation in Andhra Pradesh. Moreover, poverty reduction, low child mortality, urbanisation and low levels of son preference also contribute to fertility variation. By contrast, general indicators of development such as female and male education bear no significant association with fertility variation in Andhra Pradesh.

Key words: Andhra Pradesh, India, mass media, fertility, television
Acknowledgements

This study could not have been carried out were it not for the help and kindness of several people. To all of the respondents and informants – thank you! I also wish to thank my supervisor Sten Widmalm who has given constructive guidance and encouraging feedback and for always being so positive. I have really appreciated all your help! Though a number of people helped me make the field-study a memorable experience and something quite out of the ordinary. My sincerest gratitude is extended to the people of Golconda and Chitlapalle villages for the friendship they showed me.
Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>2</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>3</td>
</tr>
</tbody>
</table>

1. Introduction 6
11. Purpose and research question 7

2. Research design 8
2.1 Theoretical approach 8
2.2 Methodological approach 8
2.3 Delimitations 9
2.4 Outline of the study 9

3. Fertility variation in Andhra Pradesh – the theories, problems and puzzles 10
3.1 Theories of fertility decline 10
3.2 Mass media and fertility 10
3.3 Economic, social and cultural factors and fertility 13
3.4 Some prior findings from the field 14
3.5 Concluding remarks 15

4. Empirical analysis of the statistical study 16
4.1 Methods and materials 16
4.1.1 Operationalization of the variables 16
4.1.2 Data material 19
4.1.3 Performance of the statistical study 19
4.1.4 Wider applications of the result 20
4.2 Statistical analysis 20
4.2.1 Descriptive statistics 20
4.2.2 Concluding remarks 22
4.2.3 Bivariate analysis 24
4.2.4 Concluding remarks 24
4.2.5 Multivariate analysis 25
4.2.6 Concluding remarks 27
5. **Empirical analysis of the comparative case study**

5.1 Methods and materials

5.1.1 Structured, focused comparison

5.1.2 Selection of the villages

5.1.3 Variables controlled for in this study

5.1.4 Performance of the field study

5.1.5 Operationalization of the variables

5.1.6 Interviewing

5.1.7 Broader applications of the results

5.2 Field study analysis

5.2.1 Analysing the results

5.2.2 Golconda village in the Hyderabad district

5.2.3 High mass media exposure in Golconda

5.2.4 Mass media’s influence on fertility in Golconda

5.2.5 Concluding remarks

5.2.6 Chitlapalle in the Mahugnabar district

5.2.7 Low mass media exposure in Chitlapalle

5.2.8 Mass media’s influence on fertility in Chitlapalle

5.2.9 Concluding remarks

5.2.10 Final remarks

6. **Final discussion**

References

Appendix
1. Introduction
Recently, I visited India. In a small, rural village in the southern state of Andhra Pradesh, I met a group of women. I asked them how many children do they have. Six children? No hands went up. Five or four? Still no hands. Three? About 40 percent of the women raised their hands. Two? Perhaps, 30 percent of the woman. One? Around 20 percent of the women. None? The remaining women. Here was a group of women where the average number of children was between two or three children. This is remarkably considering only two generations ago women in India would typically give birth to six children. Today the average birth rate in India is around three children.

India’s fertility transition has received a lot of attention in research and public debates. Most studies indicate that the fertility decline in India can be explained by improvements in economic and social conditions that have given incentives to families to lower fertility (James 2014, Sen and Drezé 2013, Subramaninen 2013). Three major factors have been brought forward. These are rising income (parents become less dependent on children as a labour force or for care in their old age), higher female education (increased knowledge and access to modern contraception), and lower child mortality (families do not have to replace lost children).

However, in Andhra Pradesh, one of India’s largest states with 85 million people, challenging questions have been raised about the nature of these claims. Andhra Pradesh has today the lowest fertility rate (1.8 children/woman) among all Indian states. But at the same time, the income level is below the national average, female education is the lowest in the country, and child mortality is high. Economic and social factors seem unable to explain fertility decline in the state. Some scholars (Dew, James and Sen 2013, Guilmoto 2013, Bhat 1999) argue that in Andhra Pradesh mass media has expose people to new values and attitudes that are consistent with smaller families and can explain the fertility decline. The reason is that 67 percent of Andhra Pradesh population is daily exposed to mass media, which is the highest level among all Indian states, and well above the Indian average of 42 percent (NFHS-3, 2006). However, the empirical evidence for mass media effect is vague and people’s exposure to mass media varies remarkably between Andhra Pradesh different districts. James (2014:35) argues that mass medias influence on Andhra Pradesh’s fertility variation the last years “still remains a mystery”.

6
1.1 Purpose and Research Question
The purpose of this study is to examine the influence of mass media exposure on fertility variation in Andhra Pradesh. Mass media exposure varies highly in Andhra Pradesh and this study will therefore focus on how mass media has influence fertility variation in Andhra Pradesh different administrative districts. This is more interesting rather than comparing Andhra Pradesh with other Indian states since I would like to investigate how mass media may have affected peoples fertility decisions. The study draws it theoretical origins from research in the field of developmental studies, sociology, economy, and demography. An extensive literature review within these fields reveals two competing perspectives to explain fertility variations, which constitutes the point of departure in this Master thesis. These perspectives refer to, as mentioned in the discussion above, to the influence of mass media exposure, or economic and social developments, as the main cause of Andhra Pradesh’s fertility variation. This is an issue largely unresolved and over which there is no clear consensus among scholars. There is a general tendency in the literature to align with one of either of two contrasting views. One view, initially developed from Warren Thompsons’ (1929) classical demographic transition theory, argues that the fertility variation in Andhra Pradesh is, similar to many other Indian states, due to economic and social improvements such as rising income, higher female education, and lower child mortality, even though the development of these indicators has been low. The other view draws on a number of field studies in later years (James 2014; Subramaninen 2012; Guilmoto 2005) and argues that mass media exposure, measured as access to cinema, television, radio, and newspapers, has influenced people’s attitudes and behaviours to limit childbearing and that this exposure is the main cause of the fertility variation in Andhra Pradesh. My ambition in this study is to examine the influence of mass media exposure on the fertility variation in Andhra Pradesh. However, I will also control for influence of economic and social factors because these variables have received attention in previous research. Although the empirical evidence gathered in Andhra Pradesh may not necessarily lend itself to generalisations of other Indian states, it can still provide interesting findings about the causes of Andhra Pradesh fertility variation. To achieve the purpose of this study, I would like to answer the following research question:

What influence does mass media exposure have on fertility variation in different district in Andhra Pradesh?
2. Research design

2.1 Theoretical approach
The existing theoretical and empirical research specifically dealing with the fertility variation in Andhra Pradesh is quite limited. Because my ambition with this study is to examine mass media exposure in relation to fertility variations, relevant studies dealing with these topics will be given in-depth attention. The theoretical framework gives first a basic and historical overview of the different fertility theories. Thereafter follows a review and analysis of current theories of fertility transitions, with a focus on the literature examining the influence of mass media exposure. Finally, findings from prior filed-research studies are presented. Numerous studies relating specifically to the relationships among mass media exposure, as well as economic and social factors, and fertility will be examined.

2.2 Methodological approach
In this study, I will combine a statistical study with a case study in order to examine the causes of fertility variation in Andhra Pradesh. The statistical study has a hypothetic-deductive approach and examines the relationship between mass media and fertility in a multivariate framework using an Ordinary Least Square (OLS) regression. The framework is based on a cross-sectional analysis of the most recent available data from the Indian Census (2011) and covers the entire state. The multivariate framework will also examine influences from economic and social factors such as income, female and male education, child mortality, and urbanisation. Even cultural factors like son preference will be considered. I will also control for if were in Andhra Pradesh people live influences their fertility decisions. The choice of these variables is guided by studies of demographic behaviour in Andhra Pradesh, but it also reflects the limitations of available sources. The multivariate analysis will make it possible to evaluate mass media’s influence on fertility, in relation to economic, social, and even cultural development, and to draw broad generalisations about the mass media’s role in Andhra Pradesh’s fertility transition. However, to provide a deeper understanding of how mass media may have shape people’s views and opinions about childbearing a comparative case study will be carried out. A specific focus will be put on women instead of men, because they make most decisions concerning childbearing in India (Drezé and Murthi 2001). The case study,
which has an inductive approach, will focus on two villages located in eastern Andhra Pradesh, where the effects of mass media exposure were observed and examined in relation to women’s fertility decisions. Interviews with women (10 from each village) were used as the main source of data collection and they provided an opportunity to understand what beliefs and values influenced women’s decisions about childbearing.

2.3 Delimitations
In relation to the size of this Master’s thesis, certain delimitations must be made. The majority of these lie in the limited attention given aspects other than mass media and economic, social, and cultural factors for analysing the fertility variation in Andhra Pradesh. These are the only causes examined, although these are unlikely to be the only factors influencing fertility outcomes. Other factors such as women’s participation in the workforce, family planning programmes, access to microcredits, religion, cast, or tribe affiliations, etc., may also influence fertility decisions. But these factors will not be considered because of the lack of available data. However, this is not considered a major problem because previous research (Bhat 1999; Dew, James and Sen 2002) indicates that these factors have a quite limited influence on fertility decisions in Andhra Pradesh.

2.4 Outline of the study
The next chapter (chapter 3) introduces the study’s theoretical framework. The following sections are two analysis chapters. In the first analysis chapter (chapter 4), how mass media and economic, social, and cultural factors influence fertility in Andhra Pradesh are examined using multivariate analyses. In the second analysis chapter (chapter 5), how mass media influences fertility decisions among women in two remote villages in eastern Andhra Pradesh, is elaborated in a comparative case study. The method discussions are included in the two analysis chapters. Finally, (chapter 6), all connections are discussed together and concluding remarks and suggestions for future research are discussed. The appendix contains diagrams, tables, and figures.
3. Fertility decline in Andhra Pradesh – the theories, problems, and puzzles

3.1 Theories of fertility decline
Many scholars have emphasised that “development is the best contraceptive” for fertility transitions (Becker 1960). Initially, this implied that rising income would automatically reduce poverty and led to fertility decline (Easterlin 1975). The notion of “development”, however, underwent some revision as awareness grew that rising income per se did not mean a rapid improvement in the quality of life (Sen 2007). During the last decades, the focus has shifted from economic development to “social development”, with the latter calling for economic improvements to be supplemented with direct action in fields such as female education and public health initiatives that reduce child mortality (Drezé and Murthi 2001:3). However, several recent studies have indicate that economic and social development are unable to explain fertility transitions in several countries like Bangladesh, Vietnam, Indonesia, and parts of India (Andhra Pradesh) because “the change emphasised of these theories were still minimal when the fertility decline occurred” (Dumont 2008:55). Instead, the roles of diffusion processes and changing attitudes toward smaller families, mainly caused by higher access to mass media, have gained attention. The debate pertaining to the roles of the importance of diffusion processes and economic and social changes in fertility transitions has been, according to van der Kaa (2013:43), “one of the most active debates the last years”. In the following pages, we are going to take a closer look at these theories and how they could have contributed to the fertility decline in Andhra Pradesh.

3.2 Mass media and fertility
Hornik and Mcanany (2001:208-213) have identified five mechanisms by which mass media exposure can affect fertility. The first is about media itself and how it is used. The next three focus on the effects of ideas. The last considers programmes for fertility control. These five mechanisms will be used as the basis for the comparative case study. They are by no means blueprints for how to analyse the influence that mass media has on fertility decisions. But, as Watkins (2012) argues, these five mechanisms are “the most suitable” for analysing mass media’s influence on fertility and will be used in in the comparative case study. Below, these five mechanisms are elaborated in more detail.
I. *Time and economic competition affects*

The first mechanism focuses on the time spent with mass media. If people are engaged with, for example, television in their homes, the time for socialising in the community will be less\(^1\). This may affect fertility in several ways. If socialising is important for marriage and television delays marriage, it will result in lower fertility. Or if television means that people spend more time at home and have less opportunity for non-marital sex, there may be less non-marital fertility. Another consequence is related to the cost of television. Hornik and Mcanany (2001:208) argue that there is evidence in the literature that a “television set is often the first major consumer purchase, even in households with quite low income”. Scarce resources may then compete with childbearing and reduce fertility.

II. *Mass media’s influence on elites*

Public policy in a country may favour or constrain fertility control. In this process, the country’s elites (political, economic, cultural) play an important role. Hornik and Mcanany (2001:211) argue that “mass media may affect elites how they view the world and what policy decisions they make”. Television programmes or other mass media sources’ discussion about sexuality and contraception may influence elites to initiate family planning programmes in order to reduce fertility.

III. *Mass media’s influence on population values*

Mass media may tell stories that legitimize values associated with lower fertility. Hornik and Mcanany (2001:212) argue that a “soap opera can tell a story about a woman who delays marriage so she can achieve career”. The value supporting a career over early marriage influences viewers, which results in lessened fertility. Hornik and Mcanany (2001) emphasize that the influence may be especially strong if the dramas are locally produced and in the local language and if well-educated women are shown to be respected and earn their own money. Further, Hornik and Mcanany (2001:212) argue “small

---

\(^1\)A perhaps more famous example about the relationship between television and social activities comes from Putnam (2005). Putnam attributes the decimation of America’s social involvement to the spread of television. See Putnam (2005) for a further discussion.
families on television may send a message to people to say what it means to be modern, and that to be modern is good”.

IV. Mass media’s influence mediated through news programmes
Mass media may not only carry messages about values. They may also carry a message directly aiming to reduce fertility. Hornik and Mcanany (2001:213) argue that news program may “provide information about available methods of fertility control, about services available in local clinics, or about government policies in support of reduced fertility.

V. Mass media’s influence through information, education, and communication
Family planning programs can use mass media to influence contraception decisions and fertility behaviour. Hornik and Mcanany (2001:213) argue that those programs can use a variety of approaches like “didactic programs, advertising approaches, entertainment approaches, or education approaches”. These programs are different from ordinary education programmes because they use “mass media as the primary channel, assuming that media will improve cost-effectiveness and fidelity” (Hornik and Mcanany 2001:213). They may believe, as Hornik and Mcanany (2001:213) emphasise, that mass media are “potentially less effective per person reached than alternative strategies knowing that a filed agent the great advantage of being able to respond to the needs of individuals”.

These five mechanisms will be used in the case study analysis. They will provide a useful tool to analyse how mass media exposure has influenced women’s decision about childbearing. Most of the emphasis will, however, be put on mechanism three, the mass media’s influence on population values through movies and soap operas in television and cinema. The reason is that previous research has indicated that this mechanism has the largest effect on women’s fertility decisions. Even mechanism five, the influence from family planning programs, will be intensely elaborated. The other mechanisms will also be considered, but it is more difficult to measure the affects from these mechanisms.
3.3 Economic, social, and cultural factors and fertility

Economic, social, and cultural factors can influence fertility in several ways. In the literature, there is “evidence of a causal relationship” in many countries between rising income and fertility decline (Murthi, Guio and Drezé 1995:746). Drezé and Murthi (2001:6-7) argue that in developing countries like India children are usually viewed as “economic assets” by parents because they are a “source of labour power”. This will lead to negative income effects because higher income reduces the economic dependence of parents on their children.

Research shows that female education can contribute to fertility decline in several ways. Education can raise "the opportunity cost of a woman’s time", which creates more opportunities for women to get paid work and women may prioritize work before childbearing (Becker and Lewis (1974:79). Female education may also “increase knowledge and access to modern contraception” and enhance women’s “barging power within the family” which will lead to fewer births (Rajan 2005:459). The influence from male education on the other hand is, according to Drezé and Murthi (2001:6), “likely to be smaller than that of female education because women bear the primary responsibility for child-rearing” in developing countries like India.

Reduced child mortality has also been found to have an important role in reducing fertility. First, there is what Delagado et al., (1982:35) call the replacement effect, which refers to a couple’s deliberate attempts to “replace any child who dies at an early age in order to attain a desired number of surviving offspring at the end of their reproductive life”.

The role of urbanisation has also been emphasised in research. Urban people have greater exposure to different lifestyles. For example, they may see beliefs and attitudes that emphasise small families. Additionally, they may have “better access to modern birth control, allowing urban residents to more effectively act on any desire to reduce childbearing” (Shapiro 2002:116).

Diverse cultural factors may also affect fertility decisions. Dyson and Moore (1983:465) argue that in India many parents have a “strong preference for sons over daughters”. The desire for many sons can interfere with the transition towards the
small-family norm. For example, parents may have many children in order to attain a specific number of sons.

These economic, social, and cultural factors will, together with mass media, be examined in the multivariate analysis to determine if they have any influence on the fertility decline in Andhra Pradesh.

3.4 Some prior findings from the field
Empirical findings from a number of statistical studies, as well as case studies, examining the influence of mass media on fertility have generated a highly significant relationship between the two variables. Evidence from Brazil shows that soap operas have transformed people’s views and opinion about family size. Soap operas have “introduced controversial ideas such as divorce, abortion, and premarital sex” to a large Brazilian audience (Montgomery and Casterline 2008:451). In Ethiopia, studies show that married women who listened to a radio drama about contraception “tripled their use of family planning from 24 percent who had never used the method prior to the program to 79 percent by the end of the program (Walter 2010:17). In Tanzania and Kenya, “married women who are exposed to television are six times more likely to use contraception” than the non-exposed women (Raftery et al. 1995:56). In India, there is evidence from the state of Karnataka that “print media played an important role” in the state’s fertility transition (James and Subramaninen 2005:365). In Tamil Nadu, “access to electronic media has been crucial to explain fertility decline” (Krishnamoorthy et, al. 2005:232).

There is also evidence from the literature that economic and social developments, as well as cultural features, contribute to the fertility decline. The southern Indian state Kerala, which has the lowest fertility rate in India of 1.6 children per women (Census 2011), provides an interesting example. Sen (2005:138) argues that the “roots of Kerala’s success are to be found in economic and social progress”. Kerala’s fertility rate (1.6) is even lower than China’s (1.7). Sen (2005) argues that this is explained by Kerala’s higher life expectancy (77 years compare to China’s 75), higher female literacy (92 % compared to 90 %), lower child mortality (16 compared to 56), and lower son preference (112 girls born per 100 boys when compared to China’s 87 girls born per 100 boys) (data from World Bank 2012). This demonstrates that the fertility
rate has fallen much sharper in Kerala through the use of economic, social, and cultural developments, voluntarily choices, and collaboration when compared to China’s coercive measures.

3.5 Concluding remarks
We can conclude that mass media exposure can influence fertility in at least five ways. The first is how mass media is used. The next three focus on the effects of the ideas. The last considers programmes for fertility control. I will use these five mechanisms in the case study to examine mass media’s influence on the fertility decline in Andhra Pradesh. The literature also points to the roles of rising income, increased female and male education, lower child mortality, increased urbanisation, and decreased son preference in lowering fertility. These factors will also be elaborated.
4. Empirical analysis of the statistical study

4.1 Methods and materials

The statistical study uses an Ordinary Least Square (OLS) regression analysis to examine the influence of mass media and economic, social, and cultural factors on fertility. This method, which has a hypothetic-deductive approach, is well-used in the social sciences and ranks as one of the most important tools used in the discipline. The examination takes place in a multivariate framework based on a cross-sectional analysis of sub-district data from the Census India (2011). A sub-district in Andhra Pradesh is an administrative unit and the lowest level at which information on fertility is available. The samples consist of 1125 sub-districts and cover the entire state. However, one must be aware that OLS regression can only estimate linear relationships among mass media, economic and social factors, and fertility. Non-linear associations will not be considered. One may ask if someone repeated this study if they would come to the same result. This is likely because selection of the variables and analysis units is a very important step. In order to reach similar empirical results, the same variables must be included in the analysis.

4.1.1 Operationalization of the variables

In order to achieve a high measure of validity, Esaiasson et al. (2007) argued that theoretical concepts must be well operationalized into indicators that are related to the theoretical definitions. The operationalization that I have made of the dependent variable (fertility) and the independent variables (mass media, income, female and male education, child mortality, urbanisation, and culture) is described below.

Fertility is used as the dependent variable. Fertility is measured as the total fertility rate (TFR), which is defined as “the average number of children born to a women during her lifetime” (Guilmoto and Rajan 2013). The total fertility rate is, according to Cabigon (2006:36), “the most refined measure of fertility, and the one most often used in fertility trend analysis”. The advantage of measuring the total fertility rate instead of “crude birth rate” (the number of children born in a population of a thousand every year) is that the total fertility rate is “independent of the age structure of the population” (Murthi, Guio and Drezé 1995:13).
Mass media exposure is measured as the number of households having television. Data is not available for estimating the exposure to cinema, radio, or newspapers. However, as argued in the theoretical framework, previous research demonstrated a strong association between television and fertility. Television is also the most common media source in Andhra Pradesh. Studies show that 74.3 percent of the population watches television at least once a week. In contrast, 21.6 percent read a newspaper and 19.8 percent listen to a radio once a week and 17.7 percent visit the cinema once a month. Exposure to television is therefore most likely to capture the effect of mass media on fertility (NFHS-3, 2006:68-69).

Income effects are measured as the number of people living below the poverty line (BPL). The poverty line in India is income-based and defined as “per capita expenditure for a person to consume enough calories and be able to pay for associated essentials to survive” (Planning Commission 2013:452). The poverty line in monetary terms (i.e., Rs. per capital per month) is estimated to be 328 and 454 rupees in rural areas and in urban areas, respectively. Alternative variables to measure income effects could have been gross domestic product (GDP) or number of main workers, but these variables are not available on the sub-district level. However, it is important to notice that this study measures the number of people living below the poverty line from 2001 because later estimates are not available.

Female and male education will be measured as female literacy and male literacy, because literacy is considered “one of the earliest and primary aims of education” (King and Hill 1998:42). Census India (2011) defines literacy as “a person ages seven or above who can read and write with understanding in any language”. The person may or may not have received formal education. Census data on literacy is based on self-declaration of the respondent and it classifies all individuals into only two categories, literate and illiterate.

Child mortality is, according to Drezé and Murthi (2001), an endogenous variable and is mutually interdependent with fertility. High fertility is likely to raise child mortality
due to biological and behavioural reasons\(^2\). Guilmoto (2005:67) argued that the most common way to solve the problem when the independent variable is correlated with the dependent variable is to “replace the endogenous variable” (child mortality) with a "variable that is strongly correlated, but not associated, with the dependent variable" (fertility). Child mortality is therefore replaced with a variable that measures the “proportion of households with access to safe drinking water”. The reason for this is because the World Health Organization (2008:75) argues that child mortality in India is related to "unsafe water supply and inadequate sanitation and hygiene". And UNICEF (130322) emphasises that “improvements in water and sanitation would greatly contribute to a reduction in child mortality” in India. Safe drinking water should therefore have an independent effect on fertility. Data for safe water are available from the Census (2011). The definition of access to safe drinking water is “those who collect drinking water from taps, hand pumps, and tube wells, unlike those who collect drinking water from rivers, canals, or tanks”.

*Urbanisation* will be measured as all places with a municipality, corporation, and cantonment board or notified town area committee. Additionally, all other places that have a “minimum population of 5,000 citizens, where at least 75 percent of the male main working population is engaged in non-agricultural pursuits and where there is a population density of at least 400 persons per square kilometre. The definition of urbanisation comes from the Census India (2011), which is the source of the collected data.

Diverse *cultural* factors could affect fertility decisions in Andhra Pradesh. Drezé and Murthi (2001) argue that *son preference*, the desire for a specified number of sons, fundamentally affects demographic behaviour in India. Sheps (1963) demonstrated that if all couples desired a minimum of two sons, then families would have 3.88 children on average. Further, if all couples want one son and one daughter, then the average would be 3.0 children/couple. All other factors being equal, the higher the preference for sons over daughters, the higher the average family size. For measuring the influence of son preference on fertility decisions in Andhra Pradesh, I will use the

\(^2\) High fertility is associated with shorter times between births and with bearing children at relatively young or old ages, which both increase the risk of infant mortality. If high fertility is motivated by the desire for sons, it may accompany a high mortality among unwanted girls. See Drezé and Murthi (2001:9) for a further discussion.
female-male ratio for the group that is 0-6 years of age. Drezé and Murthi (2001:9) argue that this is a "powerful indicator to examine the social response and attitude toward girl children".

Finally, I will also control for regional locations and determine if fertility decisions are influenced by where in Andhra Pradesh people live. This is interesting since, as mentioned earlier, mass media exposure and fertility levels vary highly between different parts of Andhra Pradesh. The state is usually divided into three regions, (Costal Andhra, Telengana and Rayalaseema), due to geographical and historical circumstances. By transforming these regions to dummy-variables I will be able to examine if fertility decisions in Andhra Pradesh are influenced of these three regions.

4.1.2 Data material
All data sources used in the statistical analysis, except poverty, were collected from Census India (2011). This included fertility, television, female and male literacy, safe drinking water, urbanization, and son preference. Dew, James, and Sen (2002:5) emphasise that Census data are the “most widely acceptable and frequently quoted data across India”. However, some scholars argue that Census data “suffer from obvious limitations, as they are not based on any objective measure to test the status of the respondents” (Biswal 2005:5). Statistical data are also available from the Sample Registration System (SRS), the National Family and Health Survey (NFHS) and the Household and Facility Survey (HFS), but their data usually do not go lower than the State or district level. Census India, which provides data on the sub-district level, remains therefore the major data source used in this study. Data on poverty was gathered from India´s Planning Commission from the year 2001 because data from more recent years are not available. This is important to notice since it mean that the poverty variable probably will have lower effect comparing to the other variables. I will come back to this in the analysis.

4.1.3 Performance of the statistical study
The analysis will start with the descriptive statistics, where I introduce the dependent variable and the independent variables. I will present how many observations I have data for, average values, standard deviations, and maximum and minimum values. This is done, as Sundell (2012) argues, in order to estimate if effects are small or large
and what the normal values on the selected variables are if necessary. The descriptive statistics are followed by a bivariate analysis which is, as Theorell and Svensson (2007) emphasise, useful to elaborate if the variables are correlated with each other which could lead to spurious relationships. For example, it may seem like two variables are related to each other but they are in fact caused by a third variable. Finally, the bivariate analysis leads to the multivariate analysis. There, I examine the relationships among the dependent and independent variables in a multivariate framework. The relationships will be tested in different models. This makes it possible to examine how robust the relationship between the dependent and independent variable really is. Further, we can assess if the direction and significant effect are influenced by changes in model specifications. Studmund (2001:76) argued that this “sensitive analysis” is a well-used method for making conclusions. This approach can answer the study’s research question of if and how mass media exposure, as well as economic and social developments, have contributed to the fertility decline in Andhra Pradesh. The multivariate regression will be examined for specification errors like multikollinearitet, heteroscedasticity, and outliers to make sure it provides an adequate description of the data I am working with.

4.1.4 Wider applications of the results
When comparing the result of the statistical study with other studies, it is important to be aware that the findings often depend on which variables are included in the analysis. The variables included in the multivariate analysis are based on theoretical and empirical research about the causes of the fertility variation in Andhra Pradesh and cover the entire state. However, it is probably not possible to draw broad generalisations about the influence of mass media and economic, social, and cultural factors on fertility variation in the state since there can be many other factors that also can influence fertility variation.

4.2 Statistical analysis

4.2.1 Descriptive statistics
Descriptive statistics for the dependent and independent variables are presented in Table 4.1. Fertility in Andhra Pradesh has declined from 6.4 to 1.8 children per woman since 1951 to 2011, a reduction of approximately 72 percent. This can be
compared with the Indian average where fertility declined from 6.5 to 2.4, a reduction of approximately 63 percent, during the same time period. Fertility in Andhra Pradesh remained stable (approximately six children per woman) for the first decade after India’s independence. In the 1970s, fertility began to decline. James (2010:412) argues that the decline started in the south and then gradually spread to the rest of the state. The rate of decline was quite slow in the beginning and it took three decades for fertility to drop from five to three children per woman. In the 1990s, however, a rapid demographic transition occurred and fertility was reduced from three to two children per woman in one decade. The fast decline continued during the 2000s and Andhra Pradesh reached replacement level (2.1 children per woman)\(^3\) in 2003 (James 2010). Today, Andhra Pradesh has one of the lowest fertility rates (1.8) among all the major Indian states. Fertility has declined all over the state and 20 of the 23 districts in Andhra Pradesh have a fertility rate below replacement level. In terms of sub-districts, 1004 of the 1125 sub-districts have fertility levels below replacement level.

Table 4.1 shows that approximately half of Andhra Pradesh households have a television. However, there are large differences between households. The highest access to television is found in the district of Hyderabad (85 %) and the lowest (42 %) in Mahugnabar (appendix 1). Further, Table 6.1 show that 28.1 percent of the population in Andhra Pradesh is living below the poverty line (less than 1.25 USD per day). This is slightly above the national average (27.6 %). The number of people living below the poverty line ranges from 16.5 percent in Adilabad and East Godavari to 42.4 percent in Karimnagar. This large inequality in income level is confirmed if we look at the gini coefficient (0.267) (measured as per capita consumption expenditure), which indicates a highly unequal income distribution in the state (Planning Commission 2011). Further, looking at female education, we can see that 59.4 percent of women in Andhra Pradesh are able to read and write, but there is considerable cross-sectional variability in the data. Appendix 1 shows that the highest female literacy rate is found in the district of Hyderabad (78.4 %) and the lowest is in Mahugnabar (45.7 %). In addition, we can see that male education, measured as the average male literacy in the state, is significantly higher (75.6 %) when compared to

---

\(^3\) Replacement level is the amount of fertility needed to keep the population the same from generation to generation (2.1 children per woman). It refers to the total fertility rate that will result in a stable population without it increasing or decreasing. It is expressed as the total number of live births a woman would need to have during her child bearing years, which is typically ages 15-44.
female literacy (59.7 %). This is similar for all Indian states and illustrates that families prioritise boys’ education before girls’ even in Andhra Pradesh. Table 6.1 demonstrates that 38.9 percent of the population in Andhra Pradesh have access to safe drinking water (which will be used as a proxy for child mortality because most of the infant mortality in India is related to unclean water). Further, we can see that 30.8 percent of the Andhra Pradesh population lives in urban areas. The districts with the most urban residents are located along the coastlines. The son preference indicator shows there are 994 girls per 1000 boys (0-6 years) in Andhra Pradesh. This is well above the Indian average (944) and the second highest in India after Kerala. This indicates that traditional norms and values that favour sons before daughters have only a slight influence in Andhra Pradesh. Finally, Table 4.1 shows where in Andhra Pradesh people live (used as dummy variables), which later will be used to determine if regional locations influence fertility.

4.2.2 Concluding remarks
We can conclude that a rapid fertility decline has occurred in Andhra Pradesh during the last six decades. The decline has taken place all over the state. People’s access to television and economic and social developments have considerable cross-sectional variation between the different districts and sub-districts. The same is observed for son preference. This indicates that where people live in Andhra Pradesh may have a significant influence on fertility decisions.
Table 4.1 Variable Definitions and Sample Means in Andhra Pradesh in 2011

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Definition</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility</td>
<td>Total Fertility Rate (TFR) (number of children/woman)</td>
<td>1.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.24)</td>
</tr>
<tr>
<td>Mass media</td>
<td>Proportion of households having television (%)</td>
<td>51.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(13.93)</td>
</tr>
<tr>
<td>Income</td>
<td>Proportion of the population living below the poverty line (%)</td>
<td>28.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8.16)</td>
</tr>
<tr>
<td>Female Education</td>
<td>Proportion of woman 7 years of age or older who are literate (%)</td>
<td>59.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(9.54)</td>
</tr>
<tr>
<td>Child Mortality</td>
<td>Infants (less than one year old) deaths per thousand live births</td>
<td>43.43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.11)</td>
</tr>
<tr>
<td>Access to safe</td>
<td>Proportion of households with access to safe drinking water from treated</td>
<td>38.90</td>
</tr>
<tr>
<td>drinking water</td>
<td>source (%)</td>
<td>(23.39)</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>Proportion of the population living in urban areas (%)</td>
<td>30.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(19.87)</td>
</tr>
<tr>
<td>Male Education</td>
<td>Proportion of men 7 years of age or older who are literate (%)</td>
<td>75.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(9.14)</td>
</tr>
<tr>
<td>Son preference</td>
<td>The number of girls per 1000 boys (0-6 years of age)</td>
<td>994.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(17.09)</td>
</tr>
<tr>
<td>Costal Andhra Dummy</td>
<td>Dummy = 1 for sub-districts in the districts of East Godavari, Guntur,</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>Krishna, Sri Potti Sriramulu Nellore, Prakam, Srikakulam, Visknapatam,</td>
<td>(0.49)</td>
</tr>
<tr>
<td></td>
<td>Visknagaram, and West Godavari</td>
<td></td>
</tr>
<tr>
<td>Telengana Dummy</td>
<td>Dummy = 1 for sub-districts in the districts of Adilabad, Hyderabad,</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Karimnagar, Khamamman, Medak, Mahugnabar, Nalgonda, Nimzabad, Rangareddy,</td>
<td>(0.49)</td>
</tr>
<tr>
<td></td>
<td>and Warangal</td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>(number of sub-districts)</td>
<td>1125</td>
</tr>
</tbody>
</table>

Note: Table 4.1 shows in the first column the dependent and independent variables. In the second column, the variables are defined (i.e., the operationalisation that I did for each variable in order to measure the effect in the multivariate analysis). The third column lists the average for each variable. Standard deviations are presented in parentheses. The dummy variables measured were in sub-districts of Andhra Pradesh where people live.

Note: Rayalaseema was used as a control group and consisted of the sub-districts in the districts of Anantapur, Chittoor, Kurnool, and YXL.

Sources: Data for total fertility rate (TFR) on sub-district level was gathered from the National Institute of Population Science in India. The estimation corresponds to the district-level data from Census India (2011) based on Guilmoto and Rajans’ (2013) calculations. Poverty data was collected from the Planning Commission Government of India (2002). Infant mortality rate (IMR) data was collected from the Sample Registration System (SRS) 2011. The rest of the data was gathered from Census India (2011).
4.2.3 Bivariate analysis

Table 4.2 shows the bivariate relationship between fertility and the independent variables. As we can see, access to *television* contributes to lower fertility. For every percentage a household’s access to television increased, fertility declined 0.005 children per woman. This mean if the Andhra Pradesh households’ access to television increase from today’s 51.5 percent to, say 80.5 percent, the total fertility rate would decrease 0.2 children per woman. This relationship goes in the theoretically expected direction that mass media exposes people to new values and attitudes that are consistent with smaller families. Further, looking at economic and social factors, we can see that *poverty* has a significant positive association with fertility, confirming that poverty reduction will lead to lower fertility. *Female literacy* on the other hand has a highly significant positive relationship with fertility, which indicates that female literacy enhances fertility. For every percentage that female literacy increased, fertility rises 0.004 children per woman. This finding was unexpected and it will be interesting to see if this significant relationship remains after I have controlled for other variables in the multivariate analysis. We can even see that *male literacy* has a positive relationship with fertility but this association is not statistically significant. Further, Table 4.2 shows that access to *safe drinking water* (a proxy for child mortality) contributes to lower fertility. Even *urbanisation* has a negative significant association with fertility, confirming that it reduces fertility. *Son preference* has a significant positive relationship with fertility, indicating that son preference enhances fertility. All these associations were predicted and expected. Finally, looking at the regional locations, we can see that Costal Andhra has a higher fertility rate (approximately 0.1 children per woman) than the Rayalaseema control group and Telengana has a lower fertility rate (0.06 children per woman).

4.2.4 Concluding remarks

We can conclude that access to television contributes to the fertility variation and has the strongest influence among all the selected variables listed in Table 4.2 (except for the regional variables). We can also conclude that reduced poverty, access to safe drinking water, and lower son preference contribute to fertility variation. Higher female and male literacy on the other hand seems to enhance fertility. It will be interesting to see if these bivariate relationships remain after I control for other factors in the multivariate analysis.
### 4.2.5 Multivariate analysis

In this section, I will examine what influence access to television, poverty reduction, higher female and male literacy, safe drinking water, urbanisation, lower son preference, and regional locations have on the fertility variation in Andhra Pradesh. The analysis will, as mentioned, take place in a multivariate framework using an Ordinary Least Square (OLS) regression.

The multivariate regression\(^4\) is illustrated in Table 4.3. Model 1 shows the relationship between mass media and fertility. Access to mass media has, as we saw in the bivariate regression, a negative and highly significant association with fertility. For every percentage that access to mass media increased, fertility declined 0.005 children per woman. In Model 2, the poverty variable was included in the regression. Poverty reduction has a positive and highly significant association with fertility. For

---

\(^4\) It is important to mention that I followed the advice of Edling and Hellström (2003:45) and diagnosed the multivariate model for multikollinearitet, heteroscedasticity, and outliers. *Multikollinearitet*, when two or more of the independent variables are correlated with each other, does not seem to be a problem because the correlation matrix shows that none of the independent variables have a correlation higher than +0.7 or less than -0.7. This result is confirmed by the VIF (Variance Inflation Factor) value, which is below 5 for all the independent variables. Nor is *heteroscedasticity*, which could “invalidate statistical tests of significance that assume that the modelling errors are uncorrelated and normally distributed and that their variances do not vary with the effects being modelled” a problem because the *Breusch-Pagan* test is 5.77, which according to the Chi2 table is very low. The last major problem that Edling and Hellström (2003:72) argued could occur in a multivariate regression is *outliers*. Outliers are units that differ too much from the average. They could create specification error and should therefore be removed. Looking at the data from the 1125 sub-districts used for the analysis, most of the sub-districts are scattered around the regression line and outliers do not seem to be a problem in the multivariate analysis.
every percentage that poverty fell, fertility declined 0.003 children per woman. Poverty did not influence the relationship between television and fertility. Further, in model 3, female literacy was added to the regression. Female literacy had, similar to the bivariate regression, a positive significant association with fertility, implying it will enhance fertility. For every percentage that female literacy increased, fertility rose by 0.005 children per woman. Female literacy did not influence television or the poverty variables. In Model 4, access to safe drinking water (a proxy for child mortality) was included to the analysis. Safe water has a negative and highly significant effect on fertility. For every percentage that people’s access to safe water increased, fertility declined by 0.002 children per woman. Safe water slightly increases the positive effect of poverty, but it does not affect the television or female literacy coefficients. In model 5, urbanisation was added to the regression. Urbanisation had a negative significant relationship with fertility. For every percentage that urbanisation increased, fertility declined by 0.002 children per woman. Urbanisation slightly increased the positive effect from female literacy, but it did not influence television, poverty, or safe water. In model 6, male literacy was included in the analysis. Male literacy has a negative relationship with fertility. For every percentage that male literacy increased, fertility declined by 0.011 children per woman. But the association is not statistically significant. Male literacy more than doubled the positive effect from female literacy, but it also reduced the variables significant association with fertility. At the same time, male literacy somewhat lowered the effect from urbanisation. Male literacy’s large influence on female literacy probably explained why the two variables were highly correlated. In model 7, son preference was added to the regression. Son preference had a significant positive effect on fertility. For every step on the scale that son preference decreased, fertility declined by 0.003 children per woman. Son preference somewhat reduced the effect from female literacy, which was still insignificant, but it did not affect the other variables. Finally, in model 8, the regional variables were added to the analysis. We saw that fertility was lower in both Costal Andhra (around 0.09 children per woman) and in Telengana (around 0.03) when compared to the control group (Rayalaseema). The regional variables somewhat reduced the positive effect from female literacy, but the other variables were unchanged.

Looking at model 8, we saw that access to television has the strongest influence on
the fertility variation in Andhra Pradesh, despite influences from the regional locations. Poverty reduction, access to safe drinking water, urbanisation, and lower son preference also contributed to the fertility variation in the state. Female and male literacy had no significant association with lower fertility. However, the explanatory power in the model was only around 17 percent, which is quite modest considering nine independent variables were included in the analysis. This indicated that the selected variables may not fully explain the fertility decline in Andhra Pradesh. I have experimented with these variables in several specifications and also performed robustness tests where I have added and removed different variables in different combinations. For example, to estimate mass media exposure, I used a variable measuring a household’s access to radios instead of access to television. Further, to determinate income effects, I have used a variable measuring the work participation rate instead of the number of people living below the poverty line. However, in all combinations tried, mass media exposure remained the most important factor explaining the fertility variation in Andhra Pradesh. I have also performed a multivariate analysis based on the district level data (N=23). A district in Andhra Pradesh is an administrative unit that is larger than a sub-district. I used, similar to the analysis for the sub-district level (N=1125) data, fertility as the dependent variable and included the same seven independent variables plus the dummy variables measuring regional locations. The results were similar, confirming the central role of mass media exposure in lowering fertility in Andhra Pradesh districts (see appendix 3).

### 4.2.6 Concluding remarks

Several lessons emerged from the results of the model eight multivariate analysis, which are shown in Table 4.3. The findings confirmed the hypothesis of an association between mass media exposure and fertility variation in Andhra Pradesh. This link was robust. In all eight models and in all the specifications I explored, mass media (measured as a household’s access to television) had a negative and highly significant effect on fertility. This demonstrated that television exposed people in Andhra Pradesh to new values and attitudes that were consistent with smaller families and contributed to the fertility variations. Table 4.3 shows that for every percentage a household’s access to mass media increased, fertility declined by 0.005 children per woman. This suggests that an increase in the Andhra Pradesh households’ access to
television from 51.5 percent today to, say, 80.5 percent would reduce the total fertility rate by 0.2 children per woman. Because mass media is robust to the inclusion of other variables measuring economic, social, and cultural factors, as well as regional locations, this demonstrated that the driving force behind the relationship is a direct link between mass media and fertility, rather than a spurious relationship. These findings are important and could help to erase doubts about the role of mass media in fertility transitions, which is still a relatively unexplored area of research.

I also concluded that economic, social, and cultural variables like poverty reduction, lower son preference, access to safe drinking water, and urbanisation contributed to the fertility variation in Andhra Pradesh. But the influence from these variables is weaker when compared to mass media exposure. Poverty reduction had the second strongest influence on fertility in Andhra Pradesh. The analysis showed that if the number of people living below the poverty line was reduced from today’s 28 percent to 10 percent, then the total fertility rate would be reduced by 0.1 children per woman. The poverty variable was supposed to work as a mechanism. When parents see children as economic assets that take part in productive work rather than providers of security in their old age, the desire for many children decreases. Worth noticing is that the poverty variable was based on data from 2001. If data from 2011 were used, similar to the other variables, poverty’s influence on fertility would probably have been stronger. Further, we can see that cultural features like lower preference for sons has, after mass media and poverty, the strongest influence on the fertility decline in Andhra Pradesh. We concluded that if parents value sons and daughters equally and were satisfied with two surviving children, even if one or two are girls (rather than wanting two boys), the feeling for repeated births was lower. Access to safe drinking water (a proxy for child mortality) also had a significant effect on fertility reduction. This may be explained if parents in Andhra Pradesh would like to replace any child who dies at an early age in order to attain a desired number of surviving offspring. In addition, urbanisation also contributed to the fertility decline, implying that urban people in Andhra Pradesh had better access to modern birth control, which allowed them to act on any desire to reduce childbearing. The dummy variables showed that where in Andhra Pradesh people live had a strong influence on fertility, even after controlling for other factors. In particular, fertility in Costal Andhra was approximately 0.09 children per woman and distinctly lower than the control group.
(Rayalaseema). In contrast, it was higher in Telangana and approximately 0.03 children per woman. These findings were unexpected, but could maybe be explained by higher exposure to mass media, weaker traditional norms and values, and increased access to contraception in Costal Andhra. However, more study is needed regarding the regional variables associated with fertility.

It is worth reflecting on the reasons why female literacy did not contribute to the fertility variation. This was also true for male literacy. This confirmed previous research that social developments, like female education, have little influence on Andhra Pradesh’s fertility variation. This non-significant relationship contrasted from most other Indian states where female literacy was shown to be one of the most important variables in lowering fertility. These findings diverged from the common notion that female literacy, as I argued in the theoretical framework, increases knowledge and access to modern contraception and that educated women prioritize work before childbearing. However, in Andhra Pradesh, which has the lowest female literacy rate among all major states, it seems like this process was modulated by other factors, and perhaps by mass media exposure. It is also possible that the absence of any significant association between female literacy and fertility reflected the lack of precision of the female literacy indicator. Another explanation could be that the relationship between female literacy and fertility may be non-linear. There is room for further research on this issue.

At the theoretical level and regarding previous research, the results from the multivariate analysis indicate that among the selected variables mass media exposure are the main causes for Andhra Pradesh’s fertility variation, but other factors like poverty reduction has contributed as well. The multivariate analysis supports the theory that emphasises that diffusion processes, changing attitudes towards smaller families, mainly caused by the appearance and spread of new ideas through mass media, have influenced Andhra Pradesh’s fertility transition. But economic and social

---

5 Interestingly, the bivariate regression between female literacy and fertility showed a statistically significant positive relationship, implying that female literacy enhanced fertility. This contrasting result was a reminder of the misleading nature of bivariate relationships in this context. After controlling for other factors in the multivariate analysis, the significant positive association between female literacy and fertility was no longer found.
factors such as poverty reduction, access to safe water, and urbanisation, as well as cultural features like lower son preference, also have significant associations with fertility variations in Andhra Pradesh. However, the influences from these variables were weaker when compared to mass media exposure. The multivariate analysis demonstrated that mass media exposure has worked in cooperation with economic, social, and cultural factors to influence people’s fertility decisions in Andhra Pradesh. Interestingly, this study also showed that where people live in Andhra Pradesh strongly influenced the fertility variation in the state. This was an unexpected result and something that needs more exploration.

However, the multivariate analysis also indicated that it would be unwise to use only these selected variables to explain the fertility variation in Andhra Pradesh, because of the low explanatory power in the model (around 17 percent). This means that 83 percent of the fertility variation in Andhra Pradesh is explained by other factors. In addition, these calculations also involved strong assumptions about causality and linearity. Instead, it seems some other factors, which were not included in this analysis, may have also contributed to the fertility variation in Andhra Pradesh. Previously studies have suggested factors like women’s participation in the workforce, access to microcredits, religion, cast or tribe affiliations. However, the most likely factor earlier studies have suggested are family planning programmes. Andhra Pradesh was one of the first Indian states to introduce a family planning programme that emphasized female sterilisation. Unfortunately, I was not able to examine the effect from family planning programmes because, as mentioned earlier, lack of statistical data. But I believe that family planning programmes may have had an influence on the fertility variation in Andhra Pradesh. Previously studies indicate that in administrative district where the family planning programme have been active, the fertility levels are lower comparing to district where the family planning programmes still haven’t been active. I will come back to this discussion in the comparative case study.

However, the most important conclusion that I can draw from the multivariate regression was that mass media exposure had a significant influence on the fertility variation in Andhra Pradesh. This is an important finding because Andhra Pradesh’s fertility transition is still an unexplored area in research. This study can help to erase
doubts about the role of mass media in Andhra Pradesh’s fertility variation. In order to provide a deeper understanding of how mass media exposure has shaped women’s views and opinions about childbearing, we are going to see how mass media exposure has influenced women’s fertility decisions in two remote villages in Andhra Pradesh in next chapter.
Table 4.3 Multivariate regressions in Andhra Pradesh using 2011 data

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>-0.005***</td>
<td>-0.005***</td>
<td>-0.005***</td>
<td>-0.005***</td>
<td>-0.005***</td>
<td>-0.005***</td>
<td>-0.005***</td>
<td>-0.005***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Poverty</td>
<td>0.003***</td>
<td>0.003***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Female literacy</td>
<td>0.005***</td>
<td>0.005***</td>
<td>0.006***</td>
<td>0.013</td>
<td>0.011</td>
<td>0.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe drinking water</td>
<td></td>
<td></td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Urbanisation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Literacy</td>
<td></td>
<td></td>
<td></td>
<td>-0.011</td>
<td>-0.011</td>
<td>-0.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Son preference</td>
<td></td>
<td></td>
<td></td>
<td>0.003***</td>
<td>0.003***</td>
<td>0.003***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costal Andhra</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.092***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.020)</td>
<td></td>
</tr>
<tr>
<td>Telengana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.031**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.019)</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>1.751***</td>
<td>1.661***</td>
<td>1.474***</td>
<td>1.432***</td>
<td>1.415***</td>
<td>1.739***</td>
<td>1.128***</td>
<td>1.456***</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.035)</td>
<td>(0.048)</td>
<td>(0.048)</td>
<td>(0.048)</td>
<td>(0.071)</td>
<td>(0.088)</td>
<td>(0.092)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.008</td>
<td>0.023</td>
<td>0.056</td>
<td>0.085</td>
<td>0.098</td>
<td>0.132</td>
<td>0.142</td>
<td>0.173</td>
</tr>
<tr>
<td>Sample size (N)</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
<td>1125</td>
</tr>
</tbody>
</table>

*** = p < 0.01  ** = p < 0.05  * = p < 0.10

Note: Standard deviations are in parentheses.

Costal Andhra: Sub-districts in the districts of East Godavari, Guntur, Krishna, Sri Potti, Nellore, Praksam, Srikakulam, Visknapatam, Visknagaram, and West Godavari

Telengana: Sub-districts in the districts of Adilabad, Hyderabad, Karimnagar, Khamamman, Medak, Mahugnabar, Nalgonda, Nizamabad, Rangareddy, and Warangal

Rayalaseema: was used as a control group and consisted of the sub-districts in the districts of Anantapur, Chittoor, Kurnool, and YXL
5. Empirical analysis of the field study

5.1 Methods and Materials
This chapter presents the empirical evidence collected during the field study in the two villages. The women are thus the units of analysis. The goal of the study was to deepen the understanding of how mass media exposure has shaped women’s views and opinions about childbearing. A special interest was placed on women because they make most of the decisions concerning childbearing in India (Drezé and Murthi 2001). It should be noted that the goal of this field study is to assess whether and how mass media exposure have contributed to fertility decisions, rather than examined how much it has contributed. It should also be mentioned that the dependent variable and outcome of interest was fertility. The independent variable was mass media exposure. How the two variables are operationalized will be described later.

5.1.1 Structured, focused comparison
The approach that I have chosen is the method of structured, focused comparison. This method, which has its origins in Mills’ (1843) “method of difference”, requires, as George and Bennett (2005:151) emphasised, a study of “two or more instances of well-specified phenomenon that resemble each other in every respect but one”. In this context, it is mass media exposure. However, it is extremely hard to find two cases that resemble each other in every aspect but one. King, Keohane, and Verba (1994:140) emphasised that “this seldom occurs in research”. To overcome this problem, other methods such as the within-case method or the congruence method could have been used as an alternative. However, the advantage of the structured, focused comparative method, which attempt to control for other variables, is that the study “allows for a more substantial and detailed examination of the variables at work” (George and Bennett 2005:149). Numerous variables may affect the choices women in Andhra Pradesh make concerning childbearing. King, Keohane, and Verba (1994:156) argued that a comparative case study therefore must carefully specify which variables are being examined, “in addition to which and for what reasons other potential variables are controlled for”. However, as shown in the statistical study, mass media was not the only variable influencing fertility decisions in Andhra Pradesh. But given my limitations regarding time, space, and resources, it was not possible to study all the factors that may have been present. This study does not
address the potential looping effects where the fertility variations may have positive effects on access to mass media.

5.1.2 Selection of the villages
The two villages carefully selected for the purpose of this case study were Golconda, located in the Hyderabad district, and Chitlapalle, located in Mahugnabar district. My intention when selecting the two villages was to locate villages that were as similar as possible in all aspects apart from mass media exposure. I acknowledge that a complete controlled comparison was unobtainable. The villages were also selected on the basis of their representativeness because the study’s goal was to derive conclusions from the specific villages and compare the two. I also wanted to find some general conclusions about the determinants of the fertility variations in Andhra Pradesh. It was predicted that in a village with high exposure to mass media, fertility levels would be lower. In villages with low levels of mass media exposure, fertility levels would be higher. After close consultation and discussion with representatives from the government of Andhra Pradesh, who were working with the state’s family planning programme, and with NGOs, who were working with women-related issues like abortion, contraception, etc., the village of Golconda in the Hyderabad district, with high mass media exposure, and the village of Chitlapalle in the Mahugnabar district, with low mass media exposure, were finally selected. It is important to mention that when I chose the villages I did not know the fertility levels in the two villages or in the sub-district the villages belonged to. The selection took place based only on the value of mass media exposure. Later, however, it turned out that the village with high mass media exposure, Golconda, had low fertility levels. Also, the village with low mass media exposure, Chitlapalle, had high fertility levels. Further, it is important to notice that the causal interference made in the coming chapters relate primarily to a population that should be considered as a wider theoretical population – the set of similar mass media exposure which have been the attention of previous research. Given the fact that the villages also were a reflection of the local context, it was also possible to make inferences about the physical population (e.g., other rural villages in Andhra Pradesh) (Theorell and Svensson 2007:238-242). This method requires a deeper understanding of the theoretical considerations behind the chosen variables, which was the goal in the theoretical framework.
5.1.3 Variables controlled for in the field study

When selecting the cases, a number of variables must, as King, Keohane, and Verba (1994:137) emphasised “be held constant to isolate the key variable”. For my study, the key variable was mass media exposure. The variables that were controlled for were *economic* and *social* factors such as income, female and male education, and child mortality. Access to mass media is usually higher in areas with high economic and social developments. I also controlled for the *size* of the villages (access to mass media is usually higher in big cities compared to small cities), the *distance* of the villages to the nearest town (mass media exposure is usually higher in urban areas compared to rural areas), and the *ethnic/cast/tribe/religious* composition of the villages (access to mass media can be different between different groups). For example, tribal populations usually live in remote areas and can have lower access to mass media.

5.1.4 Performance of the field study

The field study was conducted in Andhra Pradesh in February 2010. Twenty interviews, ten per village, were the main source of data collection, but were also supplemented with an array of different documents. The first step of the field-study was to travel to Mumbai and interview researchers at India’s National Institute for Population Science (NIPS). The scholars at the institute provided me with a good overview of the fertility transition that has occurred in India and in Andhra Pradesh. Further, I travelled to Andhra Pradesh. Upon arrival in the city of Hyderabad, and later in Mahugnabar, I tried to get well-acquainted with the case and the local context. I reviewed written materials and met and interviewed people with knowledge about the villages, governmental authorities, NGOs, and academic scholars in order to acquire a vital background understanding. The field study itself was conducted during two intense weeks when I stayed in Golconda and Chitlapalle, while using Hyderabad city as a base. One may ask if someone repeating this study at a later point in time or using different methods would get different data? I believe so. But if mass media exposure, access to cinema, television, radio and newspapers, increases in Chitlapalle, the influence on fertility would probably be different. It should also be mentioned that this study mainly originated within the framework of development studies and political science. Researchers in other disciplines, say anthropology or economy, may
have different theoretical and methodological approaches and their conclusions may therefore be different.

5.1.5 Operationalization of the variables
In order to achieve a high measure of validity, the theoretical concepts in the field study must, similar to the statistical study, be well operationalised into indicators that are related to the theoretical definitions (Theorell and Svensson 2007). The operationalisations that I have made regarding the dependent variable, fertility, are:

- *Fertility* is defined as the number of children born to a woman during her lifetime.

The operationalisations that I have made of the independent variable, mass media exposure, are:

- *Mass media* exposure refers to the number of women that visit the cinema at least once a month or watch television, listen to radio, or read a newspaper or a magazine at least once a week.

Some additional remarks may be done. The units of analysis are women (individuals). They constitute the lowest level of analysis in the villages. Alternative units may have been households in order to measure intra-household aspects (e.g., the influence of males and mother-in-laws on fertility decisions). However, I did not have the time or resources to examine different household characteristics.

5.1.6 Interviewing
The majority of the empirical data gathered stems from interviews conducted in the visited villages. In-depth interviews bear, as Esaiasson et al. (2007:283-286) emphasised, a number of advantages. First, it gave me a chance to try and understand how the women interpret the world and what beliefs and values influence their decisions regarding childbearing. Second, interviews gave me an opportunity to get unexpected answers and allowed for follow-up questions. The interviews were conducted in the two villages’ central hospitals. The women gathered there had decided to undergo a sterilisation operation in order to limit childbearing. This operation was arranged by the Andhra Pradesh family planning programme. This is important to notice. I have chosen to interview women, from both villages, that already have decided to stop childbearing. The women I interview had therefore a
strong connection to the dependent variable, fertility. This is in the academic literature known as *sample selection bias* and can give rise to the validity of the study may be undermined. Collier and Mahoney (1996:88) argue that sample selection bias may raise somewhat distinctive issues in comparative analyses that focus on extreme cases on the dependent variable. The problem for a small comparative study like this one, given the tendency to discover new explanations, the risk may lie in overestimating the importance of explanations discovered of extremely observations. This involving what Collier and Mahoney (1996:88) called complexification based on extreme cases. However, Collier and Mahoney (1996:88) also emphasis that if I recognize the way in which extreme cases are expected to be distinctive, their inclination toward complexification “can lead to invaluable insights into those cases and into their relation to a broader set of observations”. The reason to why I choose to interview women that already had decided to stop childbearing by undergo a sterilisation operation was that my intention was to find out what influence mass media exposure had on their fertility decisions. I will come back to this discussion in the analysis chapter.

At the hospitals the manager for the family planning programme explained the purpose of the field study to the women, which provided a degree of legitimacy for the study. It was also made clear that the interviews were voluntarily and anonymous in order to avoid socially acceptable answers. Ten women from both Golconda and Chitlapalle were randomly chosen for interviews. Ten interviews in each village were, according to Teorell and Svensson (2007), a suitable amount of respondents for a small comparative case study. The method I used for randomization was to pick among the women gathered at the hospital. All the chosen women accepted to participate in the field study. The interviews themselves were conducted in an office inside the hospital. An interpreter (a female nurse working at the hospital) was used for all interviews to translate from the local Telugu-language, even though some women spoke some English. The questions were designed and asked (see the interview guide in appendix 4) in a manner that hopefully allowed the women to feel comfortable enough to talk about their fertility decisions. Follow-up questions were

---

6 The interpreters were two female nurses that worked in the hospitals. They worked with women-related issues at the hospital and had knowledge about the topics discussed. Before the interviews were carried out, I made it clear that both nurses understand and speak English at the level needed for the interviews.
often used. All interviews were recorded on tape but I also made notes. Each interview took around 40 minutes. However, the interview method had some limitations. First, I, the interviewer, am a male foreigner. I was born in India, but I do not speak the local language. Second, I asked the women about very personal matters (childbearing, contraception, etc.). The women may have had doubts and insecurities before and during the interview. It is possible that the answers given were not fully accurate or truthful because the women may have preconceived ideas about how to respond to a foreigner. However, to avoid these limitations, my interpreters, the female nurses at the two hospitals, were a great help and answered questions about the study. My impression was that the women felt comfortable and answered my questions honestly.

5.1.7 Broader applications of the results
The results and conclusions drawn from this case study may be appealing in themselves because this study attempts to shed light on the role of mass media exposure in Andhra Pradesh’s fertility transition. However, since only ten women from each village have been interviewed, the selection of the respondents suffer from sample selection bias and local context play a key role in women’s fertility decisions, I believe it will not be possible to make any broader applications of the results outside the villages.
5.2 Field study analysis

5.2.1 Analysing the results
The following section presents the empirical evidence collected during the field study in Golconda and Chitlapalle villages. The findings concerning the independent variable, *mass media exposure*, was analysed in two ways. The first was to determine the difference in mass media exposure between the two villages and second was to assess to what degree the women perceived these disparities subjectively. However, because the purpose of this study was not to analyse mass media exposure *per se*, this presentation was relatively descriptive. Instead, emphasis was placed on the dependent variable, *fertility*. The analysis was based on interviews in the villages, which were examined using Hornik and Mcanany’s (2001) five mechanisms that were presented in the theoretical framework (chapter 3). This process was undertaken in order to assess the degree of mass media exposure and to determine if the villages fulfil the criteria that Hornik and Mcanany stated influence fertility. This method provided a systematic way of presenting the results and it was also a good way to measure mass media’s influence on fertility variation.

5.2.2 Golconda village in the Hyderabad district
Golconda is a village consisting of around 3,000 people. The village is approximately 14 kilometres southwest of the city of Hyderabad. The village belongs to the sub-district Maredpalle. Golconda village is characteristic of high exposure to mass media and low fertility (1.6 children per women) (Census India 2011). The most common mass media tool is cinema, over 90 percent of the population goes to cinema once a month. Even access to television is high, 72 percent of the population watches television at least once a week. The same is true for radio, 67 percent of the population listening to radio at least once a week. However, exposure to newspaper/magazine is lower. Only 37 percent of the population reads a newspaper/magazine once a week (Census India 2011). Further, looking at the economic and social development we can conclude that approximately 30 percent of the population lives below the poverty line, 40 percent of women are illiterate, and 45 out of 1000 children die before the age of one (Planning Commission 2002, Census 2011). Of the ten interviewed women, seven had two children and three had one child. Six of the women lacked education; two had five years of education and two had
eleven years schooling. Seven of the women were Hindus; two were Christian and one was Muslim. Four of the Hindu women belonged to the scheduled cast (Dalit’s) and three belonged to the Shudras cast. None of the women belonged to any minority group.

5.2.3 High mass media exposure in Golconda

Four indicators were used to measure the independent variable, mass media exposure. They were visiting the cinema at least once a month and watching television, listening to the radio, or reading a newspaper/magazine at least once a week. The evidence from the ten interviews suggested that Golconda village was characterised by high mass media exposure. All respondents stated that they daily were exposed to some form of mass media. Many were exposed to several of the above-mentioned indicators. All women claimed that they went to a nearby cinema at least once a month and several women went to cinema at least twice a month. All women preferred to watch movies in the local Telugu-language, which were produced by the states movie industry, Tollywood. Popular themes were love stories. Eight women stated they had television at home and watched TV almost every night. The two women who did not said they watched television at their neighbours. The women said they usually looked at Tollywood movies or soap operas and sometimes news programs. All ten women had a radio at home but most of them claimed they “didn’t use it so much”. Instead, they preferred watching television. Only two of the ten women were literate, but these two claimed they seldom read a newspaper/magazine because it was too expensive to buy. When asking the women about how they subjectively perceived both their own and the whole village’s exposure to mass media, all women stated that they and the community had good exposure to several forms of mass media sources. No one claimed they lacked mass media. To conclude, the findings indicated that Golconda had a high exposure to mass media, especially cinema and television. This was manifested both in absolute terms and by how the women perceived their own situation.

5.2.4 Mass media’s influence on fertility in Golconda

As discussed in the theoretical framework (chapter 3), Hornik and Mcanany (2001) argue that there are five major mechanisms by which mass media exposure could influence fertility. The first is about media itself, how it is used. The next three focus
on the effects of ideas. The last considers programmes for fertility control. These hypotheses will be elaborated below in relation to the interview answers provided by women from Golconda.

I. Time and economic competition effects
This mechanism emphasised that if women were engaged with mass media, time for socialising in the community would be reduced. This may, if socialising was important for marriage, delay the age of marriage, which would result in reduced fertility. However, all ten interviewed women claimed that the time they spent with mass media did not affect their social life or their abilities to find a husband. The hypothesis also claimed that the cost of mass media, particularly a television, would compete with resources for children. However, none of the women, including the eight who had television at home, said the cost for mass media sources influenced their fertility decisions.

II. Mass media’s effects on elites
This mechanism claimed that mass media influenced elites to initiate actions in order to reduce fertility. However, none of the interviewed women belonged to the village’s elites. All the women I talked to were poor and had limited influence on how the village was run. Nor did any of the women say they had contacts with the local elites, for example local government or high administration figures. One woman said “I don’t know anyone who makes the decisions in our village”. This mechanism was therefore quite difficult to measure in Golconda.

III. Mass media’s effects on population values
This mechanism emphasised that exposure to mass media could legitimize values associated with lower fertility. All ten women claimed during the interviews that Tollywood movies shown in cinema and television have affected their values and attitudes about family size in direction of lower fertility. One woman said that “in the movies, women had very few children, I think that is good”. This indicated that she modified her behaviour and tried to copy the movies, where the women had decided to have only a few children. She was very clear that the major cause of her decision to limit childbearing was the Tollywood movies. Another woman said she had gotten the impression that “women seem to have much more freedom when they have fewer
children”. She said after she begun watching movies on television that she wanted more freedom in her life. She had two children and said that was enough. If she had more children, she was afraid of losing her freedom. She referred to her mother, who had given birth to six children, and she claimed that her mother spent most of her life raising children. She did not want that. A third woman emphasized that “movies show how rich women live their lives and they usually have only one or two children and this is how I would like to live my life”. A fourth woman emphasised that “movies show how modern women live today and then you only have one or two children”. For this woman, it was important to be modern and that meant having few children. The interviews indicated that movies shown on television have legitimate values associated with lower fertility, regardless of the women’s level of income, education, religion, or cast.

IV. Direct effect of mass media on fertility decisions
This mechanism claimed that news programs may have provided information about available methods of fertility control. All the interviewed woman said they had seen information about contraception in various news programs. One woman said she had seen “a news program about pills” and after that she had gone to her local nurse and asked for contraceptive pills. Another woman remembered that she had seen “a TV program about the importance of using condoms to protect myself and my husband from HIV”. After the program, she had discussed the use of condoms with her friends, not only to protect her from HIV, but also as a way to limit childbearing. Another woman talked about a “news program that discussed female sterilisation” and she thought that this was a good idea for limiting childbearing.

V. Mass media’s effects on fertility through information, education, and communication
This mechanism claimed that family planning programs could use mass media to influence contraception decisions and fertility behaviour. Eight of the ten interviewed women had heard about Andhra Pradesh’s family planning program through mass media, most of them through television. The other two had heard about the family planning programme from friends. One woman told me “I got information about the state’s family planning programme from television”. Another woman said, “In a television commercial, I saw where I could buy pills”. Four women mentioned that
they had “seen commercials from the family planning programme on television about female sterilisation”. Two women said they had seen commercials about family planning in the cinema. However, important to notice is that this hypothesis is a little bit problematic to measure. One can raise the question what factors have influence the women; the exposure to mass media or the family planning programmes themselves? Since the interviews was carried out at a hospital were women have already decided to perform a sterilisation operation provided by Andhra Pradesh family planning programme, it is difficult to know what have affected the women. What have happened if the family planning programme didn’t have used mass media for influence women’s contraception decisions? Have they still come to the hospital? As the interview answer demonstrate eight of the women said that they get information about the family planning programme from mass media. But two of the women get information from friends, which indicate that family planning programmes have influence without mass media. If mass media should have been unpresented, should the eight women also got information about the family planning programme from friends? Should that have convinced them to perform the sterilisation operation? This is difficult to know. When I interviewed the women all ten of them, even the two who had heard about the family planning programme from friends, said that the major influence to convinced them to perform the sterilisation operation came from mass media exposure.

5.2.5 Concluding remarks
The bulk of the findings presented above indicated that there was a relationship between mass media exposure and the fertility decline in Golconda. This was manifested both in absolute terms and by how the women perceived their own situation. Women’s high exposure to mass media, especially Tollywood movies shown on television and in the cinema, seemed to have affected women’s beliefs and values about childbearing. All of the interviewed women claimed that mass media, especially movies shown on the television and to some extent in the cinema, have changed their perceptions about childbearing in direction of lower fertility. Several women said that they tried to copy the behaviour of having few children like the women they saw on television. They related having fewer children with something good, being modern, and have more freedom. One woman said during the interview that “movies show how rich women lived their lives and they usually have one or two
children”, and that this was how she wanted to live her life. The relationship between mass media and fertility seemed to work in two ways. First, there was an indirect (or even unintended) effect where exposure to television and cinema influenced the women’s perception about family size in the direction of smaller families. Second, there was a direct effect where mass media seemed to have been an important tool for spreading family planning messages. This process took place regardless of woman’s level of income, education, religion, or cast. However, the interviews also indicate that the family planning programmes may have had an effect on its own, without mass media, to influence women to perform a sterilisation operation. In addition, several women also mentioned that higher income and reduced poverty had done that their dependence of many children as source of labour power had been lower. Therefore, they had decided to limit childbearing. Some women also talked about that they have got new ideas and values about family size from other women they had meet in Hyderabad city. When they travelled to Hyderabad (four hours by bus) they had meet women as they think look modern and they had only one or two children. They also said that they had get information about different ways of birth control in Hyderabad city. This indicate that the ability to travel to a big town (urbanisation effect) have had an influence on women’s decision on childbearing in Golconda village.

However, there was a risk that the answers the respondents gave during the interviews might have been overly positive or exaggerated in order to make the village seem more developed and modern than it actually was. I counterbalanced this by interviewing governmental figures and NGOs and they confirmed that Golconda’s high exposure to mass media had influenced fertility decisions. Mrs Magnawati, who is responsible for Andhra Pradesh’s family planning programme, claimed that “mass media channels such as commercials in cinema and television are very important tools for spreading information on how to limit fertility in Golconda”. Even Rekha Pande at Ankuram, a nongovernmental organisation working for women’s rights, emphasised that “mass media influenced the value and opinions of women’s fertility decisions”. In next section, we are going to examine how mass media exposure has influenced fertility decisions in Chitlapalle.
5.2.6 Chitlapalle in the Mahbubnagar district
Chitlapalle is a village consisting of approximately 3,000 people. Chitlapalle is located approximately 16 kilometres from the city of Mahugnabar. The village belongs to the sub-district Veldanda. The sub-district has low exposure to mass media (27 %) and relatively high fertility (2.3) (Census India 2011). The most common mass media tool in Chitlapalle is, similar to Golconda, cinema. But the exposure to cinema is much lower in Chitlapalle, only around 30 percent of the population goes to cinema once a month. Even access to television is low, 27 percent of the population watches television at least once a week. Even access to radio is low, 22 percent of the population listening to radio at least once a week. The lowest mass media exposure is to newspaper/magazine. Only 11 percent of the population in Chitlapalle reads a newspaper/magazine once a week (Census India 2011). Looking at the economic and social development we can see that approximately 36 percent of the population lives below the poverty line, 47 percent of women are illiterate, and 47 of 1000 children die before the age of one, which is quite similar to Golconda (Planning Commission 2002; Census India 2011). Of the ten interviewed women, six had two children and four had three children. Eight of the women lacked education and two had four years of education. Eight of the women were Hindus, one was Christian, and one was Muslim. Seven of the Hindu women belonged to the scheduled cast (Dalit’s) and one belonged to the Shudras cast.

5.2.7 Low mass media exposure in Chitlapalle
Mass media exposure in Chitlapalle was analysed, similar to Golconda, by using four indicators. These indicators were visiting the cinema at least once a month and watching television, listening to the radio, and reading newspaper/magazine at least once a week. The evidence from the ten interviews suggested, in contrast to Golconda, that the women living in Chitlapalle had little exposure to mass media. Seven out of ten women claimed that they were not exposed to any form of mass media daily. However, all ten women said they went to a nearby cinema at least once a month. All women preferred, similar to those from Golconda, to watch love stories in the local Telugu-language, which were produced by the state’s movie industry, Tollywood. However, only two women said they had television at home. In contrast, eight women interviewed in Golconda had television at home. Three of the women had a radio at home and listened to it at least once a week. None of the women were
literate, so they did not read newspapers or magazines. When I asked the women about how they subjectively perceived both their own and the whole village’s exposure to mass media, all women claimed that they and their community had a low exposure to mass media, except for cinema. To conclude, the findings indicated that Chitlapalle had a low exposure to mass media, except for cinema. This was manifested both in absolute terms and by how the women perceived their own situation.

5.2.8 Mass media’s influence on fertility in Chitlapalle
The analysis of mass media’s influence on fertility in Chitlapalle was, similar to the analysis used in Golconda village, based on Hornik and Mcanany’s (2001) five mechanisms of how mass media could affect fertility. The first mechanism is about media itself, how it is used. The next three focus on the effects of ideas. The last considers programmes for fertility control. These five mechanisms will be examined in relation to the ten interviewees’ answers from Chitlapalle.

I. Time and economic competition effects
Again, this mechanism emphasised if women were engaged with mass media, time for socialising in the community would be reduced, which may delay the age of marriage and result in reduced fertility. All interviewed women claimed the time that they spent with mass media was quite low. All women went to the cinema at least once a month but, similar to women living in Golconda, none of the women claimed that the time they spent at the cinema affected their social life or their abilities to find a husband. This was also true for watching television and listening to radio for the women who had these possessions. Nor did any of the women say that the cost for visiting the cinema or buying a television competed with the decision of childbearing.

II. Mass media’s effects on elites
This mechanism claims that mass media influences elites to initiate actions in order to reduce fertility. None of the women interviewed in Chitlapalle belonged to the village’s elites. All ten interviewed women were poor and illiterate and had limited contact with the local elites. One woman said, similar to a woman in Golconda, that “I don’t know anyone who is in charge in the local government or who makes the decisions”. Mass media’s effect on elites in Chitlapalle was therefore difficult to
measure.

III. Mass media’s effects on population values
This mechanism emphasised that exposure to mass media could legitimize values associated with lower fertility. In contrast to Golconda, only three women claimed that mass media exposure had, to some extent, influenced their decisions about childbearing. Interestingly, these were the two women who had television at home. One of these women emphasized “in the movies, women have only one or two children and that makes it possible for women to live life independently and that is how I would like to live my life”. The rest of the interviewed women in Chitlapalle, however, rejected that mass media had influenced their fertility decisions. They said they seldom saw movies at the cinema or on television. The low media exposure had not, in contrast to Golconda, enticed them to copy a different fertility behaviour or change their values and attitudes about family size. When asked what factors influenced them when they decided on how many children they should have, and especially to perform a sterilisation operation, they talked more about economic factors, like the cost of educating many children, which was one reason to limit childbearing.

IV. Direct effect of mass media on fertility decisions
This mechanism claims that news program may provide information about available methods of fertility control. Only one woman claimed she had seen information about contraception in a news program. This woman, who was one of the women that had a television, said she saw a “news program on the television about female sterilisation to limit childbearing”, and this was the reason she had decided to come to the hospital do perform a sterilisation operation. It was interesting that most of the women had not seen information about fertility control through a form of mass media. However, most of the women were aware of methods for fertility control. They got their information from friends and local doctors and nurses. This showed that knowledge to limit fertility can spread through mechanisms other than mass media exposure.
V. Mass media’s effects on fertility through information, education, and communication

This mechanism claims that family planning programs can use mass media to influence contraception decisions and fertility behaviour. Four women had heard about Andhra Pradesh’s family planning programme from mass media. These women obtained knowledge about the programme from commercials they saw at the cinema. However, six of the interviewed women claimed they had not seen or heard any information at all about contraception or fertility regulations. Instead, they received information about the family planning programme from friends. This hypothesis is, as mentioned, a little bit problematic to measure. Similar to Golconda village one can raise the question what factors have influence the women; the exposure to mass media or the family planning programmes themselves? Even in Chitlapalle village the interviews was carried out at a hospital were women already have decided to perform a sterilisation operation provided by Andhra Pradesh family planning programme. One can ask the question what have happened if the family programme didn’t have used mass media for influence women’s contraception decision? The interview answer show that only four out of ten women had heard about the family planning programme from mass media. Six of the women had got information about the sterilisation operation from friends. This indicate that family planning programmes in Chitlapalle had influence the majority of the women to perform a sterilisation operation without the help of mass media.

5.2.9 Concluding remarks

The empirical evidence gathered in Chitlapalle through the interviews indicates the women have quite low exposure to mass media, especially compared with Golconda village. Few women watched television, listened to radio, or read newspapers/magazine. However, all the women went to the cinema at least once a month. Mass media exposure seemed to have quite weak influence on women’s fertility decisions in Chitlapalle. Only the two women who had televisions claimed that mass media slightly influenced their decisions about childbearing. Nevertheless, women living in Chitlapalle desired to lower fertility, even though this desire was lower compared to women living in Golconda. The desire to limit fertility seemed to come from other factors rather than mass media exposure. The interviewees indicated that factors like rising income and poverty reduction, lower levels of son preference
and improved health which have reduced child mortality rate, also have contributed. One women I talked to said that her and her husband’s wages had been higher the last years. This had led to that their income had risen and the family’s dependence of many children as source of labour power had been lower. Therefore, she, and her husband, had decided to limit childbearing. This confirm the evidence from the statistical study that economic factors like poverty reduction have contributed to fertility transition. Further, several women I talked to emphasised that they didn’t prefer to give birth to boys before girls. They said that one boy and one girl was god. Some of the women had two girls but they said they were happy with that. They didn’t want to have more children, in order to attain a specific number of sons. And these women had decided to do a sterilisation operation to stop childbearing. This differ these women from earlier generations. Just a generation ago most women in India had a strong preference for sons over daughters. The women I talked to in Chitlapalle said that their own mothers had preferred to have many sons. This demonstrate that cultural factors had played a role in women’s decision to limit childbearing in Chitlapalle village, which also confirm the evidence from the statistical study. However, the idea to see boys and girls as equally didn’t seem to come from mass media exposure. Instead the women in Chitlapalle claims that this idea comes from friends (when asked were the friends had got these ideas the women said they didn’t know). The women also claimed that the medical and health situation in Chitlapalle village had been improved the last years. This had contributed to lower child mortality rate. Since women known that their children would survive their early ages, there was no need for them to have many children. This also confirms the result from the statistical analysis that demonstrated that if child mortality is improved it will contribute to lower fertility rates.

The interviews in Chitlapalle indicate that mass media has not indirectly influenced women’s values and beliefs about childbearing (the two women with a television at home are the exception). This was most likely due to the low mass media exposure. Neither did mass media have a direct effect and was not a successful tool used by the state’s family planning programme. Only four of the women claimed that they had seen information about family planning in some form of mass media. However, since six women had got information about the sterilisation operation from friends this indicate, similar to Golconda village, that family planning programme is a variable
that have influence on its own. In general, however, women’s desire to reduce fertility in Chitlapalle seemed to come from other factors than mass media exposure and family planning programme. This is mainly economic factors like poverty reduction, changed cultural values where girls are seemed as valuable as boys and improved health situation that have reduced child mortality which has contributed to fewer births.

5.2.10 Final remarks
The main conclusions we can make from the field-study in Golconda and Chitlapalle are that in Golconda, where mass media exposure was highly present and thriving, mass media seem to have been the major influence for women’s decisions to lower fertility, even as economic factors also had effect. In contrast, in Chitlapalle, where mass media exposure was low, women’s decisions to lower fertility seemed to come from other factors such as economic development, lower desire for many sons and improved health status that have reduced child mortality rate. However, as I discussed in the method chapter, I have chosen to interview women in both Golconda and Chitlapalle that already have decided to stop childbearing. The women I interview had therefore a strong connection to the dependent variable, fertility. This can give rise to the validity of the study be undermined (sample selection bias). The risk here is that I overestimating the answers given from the interview answers. Therefore, I believe I should be very carefully to make conclusions from the field study. The findings from this study are probably not applicable to a wider demographic field of research. I believe further research is required to determine if Golconda is a unique case of fertility transition, or if there are other villages where the amount of mass media exposure has affected women’s fertility decisions. This study gives only a small indication of the relationships between mass media exposure and fertility and considering the sample selection bias in the interviews, it is difficult to make any generalisations from the study. Future studies should aim to detect the incidence of mass media exposure in all of Andhra Pradesh. I believe that the same theoretical framework, developed by Hornik and Meenanys (2001), could be used. Further studies should therefore aim to find villages with both high and low mass media exposures.
6. Final discussion

The purpose of this Master thesis was to examine the influence of mass media exposure on fertility variation in Andhra Pradesh. The point of departure was the influence from mass media exposure, or economic and social developments, as the main cause of Andhra Pradesh’s fertility variation. This is an issue largely unresolved by current research and over which there is no clear consensus among scholars. My goal with this study was to make a small contribution to the pre-existing theoretical and empirical research to the fertility transition in Andhra Pradesh.

The main result from this study indicated there is a link between mass media exposure and the fertility variation in Andhra Pradesh. In the statistical study, mass media (measured as access to television), had a negative and highly significant association with fertility in all the models and specifications explored. The influence of mass media was robust even to the inclusion of other variables, which indicated that there was a direct link between mass media and fertility, rather than a joint effect of unobserved variables on both. The multivariate analysis suggested that if Andhra Pradesh households’ access to television increased from today’s 51.5 percent, to say 80.5 percent, it would reduce the total fertility rate by 0.2 children per woman. This was an important finding because Andhra Pradesh’s fertility variation still is an unexplored area in research. The multivariate analysis also demonstrated that economic and social factors such as poverty reduction, access to safe water, urbanisation, and even cultural features like lower son preference, have contributed to fertility variation in Andhra Pradesh. However, these factors had a weaker influence on fertility when compared to mass media. Even where people live in Andhra Pradesh (regional locations) seemed to play an important role on fertility decisions in Andhra Pradesh. This was an unexpected result and something that needs further exploration, but can maybe be explained with that people in the region Costal Andhra, which has the lowest fertility rate, have higher exposure to mass media, weaker traditional norms and values and higher access to contraception. Further, it is interesting to note that both female and male literacy did not contribute to the fertility variation, which stand in contrast to evidence from most other Indian states. This confirmed, as I argued in the beginning, that social developments like female education have little influence on Andhra Pradesh’s fertility variation.
The comparative case study confirmed the evidence from the statistical study and demonstrated that mass media exposure has played a role in fertility decisions in Andhra Pradesh. The findings from Golconda were different from those of Chitlapalle. In Golconda, which has a quite high mass media exposure, especially television and cinema, mass media seem to have influenced fertility outcomes, even as economic factors also have played a role. In Chitlapalle, which has quite low mass media exposure, the influence on fertility decisions seems to have been low. Instead, poverty reduction, changing cultural norms and values, improved health status and to some extent family planning programs, seemed to have influence women’s fertility decisions.

What relevant conclusions may we then derive from the findings of this study? At the theoretical level and regarding previous research, the results from both the statistical study and the comparative case studies, indicates that mass media exposure can influence fertility variations in Andhra Pradesh. But economic, social and even cultural variables also have significant associations with fertility variation in the state. This supports the theory which emphasises that diffusion processes, changing attitudes towards smaller families, can be caused by the appearance and spread of new ideas mediated through mass media. But, as both the multivariate analysis and the field study demonstrated, even where people lived in Andhra Pradesh seemed to be crucial for people’s fertility decisions. However, the multivariate analysis also indicated that it would be unwise rely only on the selected variables in this study to explain the fertility variation in Andhra Pradesh. The reason is that the multivariate analysis has low explanatory power in the model (around 17 percent). That means that 83 percent of the fertility variation in Andhra Pradesh is explained by other factors. The calculations also involved strong assumptions about causality and linearity. Instead, it seems some other factors, which were not included in the statistical analysis, may have also contributed to the fertility variation in Andhra Pradesh. Previously studies have suggested factors like women’s participation in the workforce, access to microcredits, religion, cast or tribe affiliations. However, one likely factor may be family planning programmes. Unfortunately, I was not able to examine the effect from family planning programmes because, as mentioned earlier, lack of statistical data. The comparative case study on the other hand show that in Golconda, where mass media exposure was highly present and thriving, mass media
seem to have been the major influence for women’s decisions about fertility, even as economic factors also had effect. In contrast, in Chitlapalle, where mass media exposure was low, women’s fertility decisions seemed to come from other factors such as economic development, lower desire for many sons and improved health status that have reduced child mortality rate. However, I have chosen to interview women in both Golconda and Chitlapalle that already have decided to stop childbearing. The women had therefore a strong connection to the dependent variable, fertility (sample selection bias). This can give rise to the validity of the study be undermined. The risk here is that I overestimating the answers given from the interview answers. Therefore, the findings from the field-study are probably not applicable to a wider demographic field of research.

In fact, this study gives probably only a small indication of the relationships between mass media exposure and fertility variation in Andhra Pradesh. Considering the low explanatory power in the multivariate analysis and the sample selection bias in the field-study interviews, it is difficult to make any generalisations from the study. Much remains to be explained regarding Andhra Pradesh fertility variation and there is plenty of questions for future research.

/Martin Ståhlgren
Email: Anil_Stahlgren@hotmail.com
References


Census India (2011). Available at: http://censusindia.gov.in/Metadata/Metada.htm#2t Collected 150713


APPENDIX 1: Sample Means and standard deviations for the 23 districts in Andhra Pradesh in 2011

<table>
<thead>
<tr>
<th>District</th>
<th>Access to television</th>
<th>Total fertility rate (TFR)</th>
<th>Female Literacy</th>
<th>Child Mortality</th>
<th>Safe drinking water</th>
<th>Poverty</th>
<th>Urbanisation</th>
<th>Male Literacy</th>
<th>Son preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adilabad</td>
<td>58.8 (10.34)</td>
<td>2.01 (0.24)</td>
<td>51.99 (9.34)</td>
<td>52.12 (10.34)</td>
<td>18.44 (17.10)</td>
<td>16.45 (10.02)</td>
<td>27.68 (18.15)</td>
<td>71.22 (5.13)</td>
<td>1003.35 (20.13)</td>
</tr>
<tr>
<td>Anantapur</td>
<td>52.3 (13.65)</td>
<td>1.91 (0.22)</td>
<td>54.31 (8.44)</td>
<td>50.34 (8.34)</td>
<td>41.95 (21.39)</td>
<td>39.34 (8.18)</td>
<td>28.09 (23.53)</td>
<td>74.09 (8.34)</td>
<td>977.54 (17.45)</td>
</tr>
<tr>
<td>Chittoor</td>
<td>56.34 (15.65)</td>
<td>1.82 (0.19)</td>
<td>63.65 (9.13)</td>
<td>38.32 (11.12)</td>
<td>38.17 (22.70)</td>
<td>23.43 (9.92)</td>
<td>29.47 (20.93)</td>
<td>81.15 (11.54)</td>
<td>1002.65 (16.45)</td>
</tr>
<tr>
<td>East Godavari</td>
<td>67.45 (17.43)</td>
<td>1.62 (0.15)</td>
<td>67.82 (10.99)</td>
<td>37.94 (12.34)</td>
<td>44.80 (24.28)</td>
<td>16.45 (11.13)</td>
<td>25.42 (20.13)</td>
<td>74.91 (9.43)</td>
<td>1005.54 (22.43)</td>
</tr>
<tr>
<td>Guntur</td>
<td>69.56 (13.56)</td>
<td>1.62 (0.20)</td>
<td>60.64 (10.02)</td>
<td>35.65 (12.34)</td>
<td>39.23 (20.05)</td>
<td>36.02 (10.02)</td>
<td>33.89 (22.43)</td>
<td>75.40 (9.04)</td>
<td>1003.54 (18.45)</td>
</tr>
<tr>
<td>Hyderabad</td>
<td>84.70 (12.01)</td>
<td>1.63 (1.10)</td>
<td>78.42 (6.43)</td>
<td>22.23 (9.45)</td>
<td>96.15 (2.92)</td>
<td>28.43 (6.23)</td>
<td>100.00 (28.43)</td>
<td>83.35 (8.45)</td>
<td>943.65 (15.45)</td>
</tr>
<tr>
<td>Karimnagar</td>
<td>70.45 (12.31)</td>
<td>1.52 (1.3)</td>
<td>55.18 (11.32)</td>
<td>42.76 (12.54)</td>
<td>35.30 (15.16)</td>
<td>42.45 (7.56)</td>
<td>26.08 (21.14)</td>
<td>74.72 (10.04)</td>
<td>1009.56 (15.88)</td>
</tr>
<tr>
<td>Khammam</td>
<td>53.55 (10.45)</td>
<td>1.62 (0.20)</td>
<td>57.85 (9.54)</td>
<td>50.45 (11.43)</td>
<td>34.14 (19.019)</td>
<td>31.34 (9.34)</td>
<td>23.43 (16.98)</td>
<td>73.20 (8.12)</td>
<td>1010.45 (20.34)</td>
</tr>
<tr>
<td>Krishna</td>
<td>46.65 (23.54)</td>
<td>1.52 (0.18)</td>
<td>69.62 (9.99)</td>
<td>27.43 (8.32)</td>
<td>53.52 (20.39)</td>
<td>24.34 (8.93)</td>
<td>41.01 (26.07)</td>
<td>79.13 (7.43)</td>
<td>997.45 (18.23)</td>
</tr>
<tr>
<td>Kurnool</td>
<td>51.34 (13.45)</td>
<td>2.22 (0.21)</td>
<td>50.81 (10.11)</td>
<td>48.32 (10.11)</td>
<td>49.83 (16.18)</td>
<td>35.45 (5.56)</td>
<td>28.06 (21.93)</td>
<td>71.36 (8.14)</td>
<td>984.45 (16.45)</td>
</tr>
<tr>
<td>Mahbubnagar</td>
<td>41.50 (19.14)</td>
<td>2.45 (0.99)</td>
<td>45.65 (14.32)</td>
<td>59.32 (15.34)</td>
<td>35.23 (16.05)</td>
<td>39.45 (7.54)</td>
<td>15.01 (25.54)</td>
<td>66.27 (14.32)</td>
<td>975.42 (17.45)</td>
</tr>
<tr>
<td>Medak</td>
<td>72.34 (14.32)</td>
<td>2.23 (0.99)</td>
<td>53.49 (9.65)</td>
<td>53.12 (10.34)</td>
<td>35.38 (17.33)</td>
<td>27.43 (6.32)</td>
<td>24.02 (18.32)</td>
<td>72.50 (11.43)</td>
<td>989.23 (16.45)</td>
</tr>
<tr>
<td>Nalgonda</td>
<td>55.45 (12.45)</td>
<td>1.81 (0.10)</td>
<td>55.05 (11.43)</td>
<td>51.98 (12.43)</td>
<td>30.70 (21.30)</td>
<td>23.45 (5.99)</td>
<td>19.00 (17.43)</td>
<td>74.93 (11.34)</td>
<td>982.95 (19.83)</td>
</tr>
<tr>
<td>Nizamabad</td>
<td>54.31 (9.54)</td>
<td>1.85 (0.34)</td>
<td>52.33 (8.45)</td>
<td>52.54 (10.11)</td>
<td>44.98 (16.81)</td>
<td>22.45 (8.45)</td>
<td>23.03 (22.45)</td>
<td>72.86 (8.43)</td>
<td>1038.99 (21.43)</td>
</tr>
<tr>
<td>Prakasam</td>
<td>61.45 (19.45)</td>
<td>1.92 (0.13)</td>
<td>53.40 (7.34)</td>
<td>41.89 (7.98)</td>
<td>25.59 (18.71)</td>
<td>24.67 (7.12)</td>
<td>19.52 (16.43)</td>
<td>73.53 (10.54)</td>
<td>981.34 (20.65)</td>
</tr>
<tr>
<td>District</td>
<td>Sample Mean</td>
<td>Standard Deviation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
<td>--------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rangareddy</td>
<td>56.65</td>
<td>(15.65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sri Potti Nellore</td>
<td>49.56</td>
<td>(15.43)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Srikakulam</td>
<td>56.76</td>
<td>(15.24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visakhapatnam</td>
<td>57.98</td>
<td>(16.45)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vizianagaram</td>
<td>63.56</td>
<td>(18.34)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warangal</td>
<td>76.45</td>
<td>(11.54)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Godavari</td>
<td>79.45</td>
<td>(17.32)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YSR</td>
<td>64.56</td>
<td>(18.45)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>58.80</td>
<td>(12.45)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>47.20</td>
<td>(17.56)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Standard deviations in parenthesis.

APPENDIX X 1: Sample Means and standard deviations for the 23 districts in Andhra Pradesh in 2011 (continued)
### APPENDIX 2. Multivariate regressions in Andhra Pradesh on District level using 2011 data

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>-0.006***</td>
<td>-0.006***</td>
<td>-0.006***</td>
<td>-0.006***</td>
<td>-0.006***</td>
<td>-0.006***</td>
<td>-0.006***</td>
<td>-0.006***</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.003)</td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Poverty</td>
<td>0.002***</td>
<td>0.003***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
<td>0.004***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Female literacy</td>
<td>0.010***</td>
<td>0.010***</td>
<td>0.009***</td>
<td>0.009</td>
<td>0.010</td>
<td>0.009</td>
<td>0.009</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Safe drinking water</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.001***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
<td>-0.000***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
<td>-0.002***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Male Literacy</td>
<td>-0.016</td>
<td>-0.016</td>
<td>-0.016</td>
<td>-0.008</td>
<td>-0.008</td>
<td>-0.008</td>
<td>-0.008</td>
<td>-0.008</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Son preference</td>
<td>0.002***</td>
<td>0.002***</td>
<td>0.002***</td>
<td>0.002***</td>
<td>0.002***</td>
<td>0.002***</td>
<td>0.002***</td>
<td>0.002***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Costal Andhra</td>
<td>0.052***</td>
<td>0.052***</td>
<td>0.052***</td>
<td>0.052***</td>
<td>0.052***</td>
<td>0.052***</td>
<td>0.052***</td>
<td>0.052***</td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Telengana</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.027**</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.845***</td>
<td>1.654***</td>
<td>1.456***</td>
<td>1.432***</td>
<td>1.455***</td>
<td>1.645***</td>
<td>1.345***</td>
<td>1.264***</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.055)</td>
<td>(0.048)</td>
<td>(0.048)</td>
<td>(0.038)</td>
<td>(0.071)</td>
<td>(0.058)</td>
<td>(0.084)</td>
</tr>
<tr>
<td>R²</td>
<td>0.009</td>
<td>0.033</td>
<td>0.069</td>
<td>0.092</td>
<td>0.101</td>
<td>0.139</td>
<td>0.147</td>
<td>0.146</td>
</tr>
<tr>
<td>Sample size (N)</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

*** = p <0.01 **= p <0.05 * = p <0.10

**Note:** Standard deviations are in parentheses.

**Costal Andhra:** the districts of East Godavari, Guntur, Krishna, Sri Potti, Nellore, Praksam, Srikakulam, Visknapatam, Visknagaram, and West Godavari

**Telengana:** the districts of Adilabad, Hyderabad, Karimnagar, Khamamman, Medak, Mahugnabar, Nalgonda, Nimzabad, Rangareddy, and Warangal

**Rayalaseema:** was used as a control group and consisted of the districts of Anantapur, Chittoor, Kurnool, and YXL
APPENDIX C 4. Interview guide

Before asking the questions relating to the actual study some time was spent getting acquainted with each individual, such as customary enquiries as to the health of the respondent, his family and then the same procedure about me, in addition to several introductory questions related to life in general in the village.

- What do you do for a livelihood?

- Do you receive an income in goods and products? If so, how much per day/week?

- What factors have influenced you to limit childbearing?

- What influence has mass media played in your decision?

- What kinds of mass media have influenced you (television, cinema, TV, radio, newspapers etc.)?

- Did you make the decisions by yourself or was your husband / mother in-law involved?