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Exploring the role of women's autonomy in contraception uptake
among rural Indian women: *A temporal approach in four states*

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Abstract

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By Priya Kekre

Background: India's reproductive health profile is marked by stark regional variations with an overall pattern of southern states faring better than their northern counterparts in fertility and contraception outcomes. Past research has hinted that the prevailing gender norms in these regions may explain the differences, with recent studies specifically examining the role of women's autonomy on outcomes such as contraception use. However, majority of these studies are cross-sectional and often lack the regional diversity essential for India's context.

Objective: This study attempts to fill the aforementioned gaps in research. The objective of this study is to investigate the temporal influence of women's autonomy, using a multidimensional measure, on contraception uptake in rural India in four diverse states: Bihar, Jharkhand, Maharashtra and Tamil Nadu.

Methods: Prospective data from two linked studies were used for analysis: India's NFHS-2, conducted in 1998-1999 and a follow-up study for a subgroup of women carried out in 2002-2003. Primary exposures included three dimensions of autonomy: financial autonomy, mobility autonomy and decision-making autonomy. Logistic regression models were used to identify associations between contraception uptake at follow-up and each autonomy dimension, in the overall sample and in state-stratified samples.

Results: Of the overall sample, only 28% of women reported contraception uptake at follow-up. Contraception uptake was significantly higher among those women who reported increased financial autonomy over time (OR=1.55 95 % CI= 1.15-2.09) compared to those who reported low financial autonomy at both points. In Maharashtra, women with high decision-making autonomy at both points were more than twice as likely to use contraception compared to those with low decision-making at both points (OR=2.67, 95% CI =1.19-6.00). Changes in decision-making autonomy and mobility autonomy were not significantly associated with contraception uptake in the overall sample.

Conclusion: Findings underscore the need to increase women's economic independence with strategies aimed at improving rural women's access to and control over finances as well as savings-oriented financial support programs. Additionally, this study stresses the importance of community-based interventions aimed at improving girls' and women's education and negotiation skills at the household level to positively influence their reproductive health.

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CHAPTER I: INTRODUCTION

India's population policies and demographic transition have long been of interest to experts around the world. Since the 1960's, India's reproductive health landscape has been marked by a myriad of government initiatives, evolving from a population control strategy to a more recent reproductive heath and women's rights approach. Accompanying this changing policy landscape, India's reproductive health indicators have also undergone dramatic changes including declines in maternal mortality and fertility (NFHS-3). Other national demographic and reproductive health indicators from the most recent National Family Health Survey (NFHS) are summarized below.

Table 1: Selected demographic and reproductive health indicators for India overall and for the rural areas from NFHS 3, 2005-2006

	Overall	Rural
Marriage and Fertility		
Women aged 20-24 married by age 18 (%)	47.4	56.2
Total fertility rate (children per woman)	2.7	3.0
Median age at first birth for women aged 25-49 years	19.8	19.3
Contraception Use in Married Women (15-49 years)		
Contraception Prevalence Rate (%)	56.3	53.0
Total Unmet Need (%)	12.8	14.1
Women's Status/Empowerment Indicators		
Literate (%)	55.0	46.0
Participate in household decision-making (%)	36.7	33.0
Ever experienced spousal violence (%)	37.2	40.2

The indicators above illustrate that women in India, particularly in the rural areas face many challenges for their reproductive health amidst a dismal socioeconomic environment. Typically, rural women tend to marry early, preceding the legal marriage age of 18 years, followed by early childbearing (Population Council, 2004). While contraceptive knowledge is high, adoption of modern methods is relatively low, even among those who don't want any more children (Chandick N., Dhillon BS., Kambo I., & Saxena NC., 2003). Often the contraceptive profile most prevalent is the adoption of sterilization, after a woman has achieved her desired fertility of two-to-three children, including at least one son. With prevalence of such practices, the inter-pregnancy intervals in India remain dangerously short; increasing the risk for adverse maternal and child health outcomes including miscarriages, still births, neonatal and maternal mortality (Cicely, 2006).

This poor health status of rural women in India is interwoven in the pervasive gender inequalities, with cultural and social norms challenging women's socioeconomic development. These gender role differentials commence from an early age wherein emphasis is placed on boys' education while girls often face constraints in attending school to help with household chores (Population Council, 2004).With such heavily rooted gender inequalities, greater value tends to be placed on the health and survival of males, rather than females. Indicators of sex ratios at birth, and infant and child mortality rates by sex (NFHS-3) reflect the male-preference in Indian society to the extent that it is limiting the birth and survival of girls. According to NFHS data, there has been a dramatic decline in the under-seven sex ratio from 934 females per 1000 males (1992-

1993) to 918 females per 1000 males (2005-2006); raising concerns that despite India's economic progress in that period, traditional norms favoring boys continue to prevail.

Since the past few decades, there has been an abundance of research trying to establish linkages between women's development and its impact on reproductive health outcomes, with a particular interest in India (Abadian, 1996; Basu, 1992; Jejeebhoy, 1991). As a proximate determinant of fertility, and the association of decreased fertility with many positive socioeconomic indicators (Myrskyla, Kohler, & Billari, 2009), contraceptive behavior is often a critical research outcome of interest. Despite this, there are very few studies empirically exploring the relationship between women's autonomy and contraception use in India. Most of this research is based on cross-sectional data despite the recognition of autonomy as a dynamic concept in the South-Asian setting (Dasgupta 1995; Lee-Rife, 2010). The cross-sectional nature of these studies does not help elucidate the directionality of the autonomy-contraception relationship. Furthermore, many studies often focus on only one or two dimensions of autonomy, when it is theoretically conceded that women's autonomy is a multidimensional construct (Jejeebhoy, 1995). Apart from these limitations, the research thus far is marked by poor generalizability with studies set in one or two Indian states. Future research is needed to explore the temporal effects of multiple dimensions of autonomy on contraception uptake, with sensitivity to India's socioeconomic and cultural diversity.

Objectives and Aims

This study aims to fill many of the aforementioned gaps in research, pertinent to India's reproductive health arena. The objective of this study is to investigate the *temporal* influence of women's autonomy, using a *multidimensional* measure, on contraception uptake in rural India. Embedded within this objective are two primary aims:

1. To describe the changes in women's autonomy over a three-year period in four states in India;

2. To examine the associations between changes in these autonomy dimensions with contraception uptake for the overall sample as well as specific to each state.

Recognizing the sociocultural diversity within India, this study is set in four distinct states of India: Bihar, Jharkhand, Maharashtra and Tamil Nadu. **Figure 1** below highlights the variations in key development and health indicators across the four states. It illustrates the overall pattern of Maharashtra and Tamil Nadu having relatively more favorable health and development indicators for women, compared to Bihar and Jharkhand.

<Insert Figure 1>

CHAPTER II: LITERATURE REVIEW

This literature review has several objectives. Firstly, the review will describe the

population and reproductive health policy landscape over the past few decades in India

for a contextualized understanding of the research. Secondly, an overview of fertility and

contraception as the key outcomes of interest will be reviewed as relevant for this study.

Thirdly, the review will synthesize the dominating paradigms used to conceptualize

women's autonomy in a South-Asian context. The complex concept of autonomy is

understandably not one without debates and the review will acknowledge these multiple

perspectives in defining autonomy. Lastly, studies exploring the relationships between

women's autonomy and contraception will be discussed. These studies will be evaluated

for their contributions to the area of research and to identify the gaps that they leave

behind in understanding the role that autonomy can play for positive reproductive health

outcomes, especially among rural women in India.

1. The Evolution of Indian Reproductive Health Policy

Since the landmark International Conference on Population and Development (ICPD)

held in Cairo in 1994, reproductive health has been placed as a central tenet of the global

health agenda. The importance of reproductive health is further reflected in the targets

embedded under the United Nation's Millennium Development Goal (MDG) #5 which

seeks to "improve maternal health" and also grant "universal access to reproductive

health" (United Nations, 2012) for women globally. In India, there has been a myriad of

population policies and national efforts to meet reproductive health and development

objectives, long predating the MDGs. These policy efforts have been accompanied by

over four decades of extensive research from the inception of India's population control strategy to the more recent period marked by a reproductive health and rights-based approach (Koenig, Foo, & Joshi, 2000). An understanding of this Indian policy landscape is warranted as important context for a discussion of the country's reproductive health outcomes.

The first national strategy on family planning in India entitled the National Family Welfare Program was launched in 1951 to regulate the rapidly growing population. Over time this initial strategy has been shaped by shifting values and priorities in the reproductive health arena. The first decade of this strategy delivered family planning services disparately from other maternal health services, through a clinic-centered basis. With concern over the increasing population growth despite this effort and the growing population's interference with India's economic development, the program objectives reverted to a more target-oriented approach during the 1960's (Santhya, 2003). Further on, this approach was coercively exploited under Indira Gandhi's leadership during the Emergency period of 1975-1977 where tactics such as forced sterilization methods and large cash incentives for men who submitted to sterilization, were used in an authoritative form to addressing India's population problem (C. H. Brown, 1984). The advances made through the family planning program were gravely stunted by these tactics and led to a radical shift in the policy efforts in the 1980s underscoring a reproductive-rights based approach. This policy shift was a reactionary measure to rebuild the Indian population's trust and reshape their attitudes towards the national family planning efforts after the Emergency period (Santhya, 2003). In 1992, the government launched the Child Survival

and Safe Motherhood Program (CSSM) reflecting this shifted focus to an integrated approach wherein family planning is provided as part of a variety of services to mothers, including antenatal care, delivery care and postnatal care. With the gradual stagnation of the Family Welfare program and organized pressure to introduce components of quality and choice to the family planning agenda in the post-ICPD Cairo atmosphere, a major policy change ensued in 1997. The services and interventions provided by the former Family Welfare Program and CSSM were amalgamated as part of the Reproductive and Child Health program; which embodied the principles of women's empowerment and shifted away from the demographic rationale for India's population control. This policy advance eliminated the Centre-driven targets for family planning which often violated reproductive health rights of women and underscored informed choice for timely and appropriate contraception use (Santhya, 2003).

Since its inception, the Reproductive and Child Health program has been implemented with varying intensity and success across the states in India; with greater overall success in the relatively more developed southern states, compared to the rest of the country. One national step to address this regional discrepancy was establishing an action group in 2001 to guide reproductive health program implementation in eight[1] states lagging behind on several socioeconomic indicators (Santhya, 2003). More recently, national policies such as the National Population Policy (NPP 2000) and the new National Health Policy (2002) draw attention to the increasing health disparities across regions as well as stark differences in access to health services between rural and

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[1] Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Orissa, Chhattisgarh, Jharkhand and Uttaranchal.

urban populations (NFHS-3). The objectives of the NPP are multifaceted and include addressing the unmet need for contraception; mitigating the limitations in health care infrastructure and the shortages in health personnel; and to provide integrated service delivery for basic reproductive and child health care. Finally, in one of the most recent policy changes, the National Rural Health Mission (NRHM) was launched in 2005 to increase access and availability of care at the rural household level. NRHM leverages a vital platform of female community health volunteers called ASHAs (Accredited Social Health Activists) who are trained to help shape health behaviors through interpersonal counseling on topics including family planning (National Rural Health Mission (2005-2012) Mission Document).

The dynamic nature of reproductive health policy over the past decades reflects the complexity of policy implementation in a multifaceted country like India as well as the evolving values guiding these policies. Some critics argue that while reproductive health policy in India may have evolved to using progressive terminology, centered on choice and rights, its translation into implementation strategies for desirable health outcomes has only been marked by modest gains and unmet goals (Koenig, et al., 2000; Santhya, 2003). Furthermore, it is commonly recognized that there is significant geographical variability within India that exists for several socioeconomic, infrastructural and health indicators (Dyson & Moore, 1983; Koenig, et al., 2000) which recurrently pose challenges in meeting national objectives. Rooted in this understanding of regional disparities, the remainder of this review will attempt to explore regional health

differences, whenever possible, by focusing on the four study states: Bihar, Jharkhand, Maharashtra and Tamil Nadu.

2. Reproductive Health Outcomes in India

2.1 Fertility: Trends and Determinants

Totally Fertility Rates (TFR), interpreted as the expected number of children a woman who survives to the end of the reproductive age span will have during her lifetime if she experiences the given age-specific fertility rates (Handbook Collection of Fertility and Mortality Data, 2003), are often the health indicator of interest for population policies. The inverse association between fertility and socioeconomic development as an empirically identified relationship in the social sciences literature (Gupta, Bongaarts, & Cleland, 2011; Myrskyla, et al., 2009) substantiates this emphasis for decreased fertility in many developing countries. At the household level, smaller family sizes are linked with decreased infant mortality, decreased maternal mortality, increased schooling and increased labor force participation for women (Gupta, et al., 2011) further igniting policy interest in fertility outcomes.

In India, the evolution of population policies and family planning programs has been credited for some of the decline in the national fertility rate. According to the National Family Health Survey (NFHS), there has been a steadily decreasing trend in the TFR through each of the three NFHS data collection periods. From the first NFHS (1992-1993) which reported a TFR of 3.4 followed by the second NFHS (1998-1999) reporting a TFR of 2.9 to India's most recent TFR estimated at an all-time low of 2.7 in 2005-2006. With the country slowly inching towards near replacement-level fertility (TFR of 2.1)

and the declining mortality rates; India is considered to be entering the final stages of the demographic transition (James, 2011).

India's fertility transition is unevenly spread across the country with striking differences in the fertility rates of the different states. Estimates in 2008 found variations in fertility ranging from 1.7 in Andhra Pradesh to 3.9 in Bihar (James, 2011). The TFRs for the four states investigated in this study are summarized in the table below using data from NFHS-3, including rural-specific rates within states. The table indicates two key patterns: higher fertility in rural areas across states and higher fertility in the northern states of Bihar and Jharkhand compared to the southern Tamil Nadu and Maharashtra.

Table 2: A comparison of the Total Fertility Rates in four states in India, 1998-1999 and 2005-2006.

	All India	Bihar	Jharkhand	Maharashtra	Tamil Nadu
NFHS 2 (1998-1999)					
Overall	2.85	3.70	-	2.52	2.19
Rural	3.07	3.82	-	2.74	2.23
NFHS 3 (2005-2006)					
Overall	2.68	4.00	3.31	2.11	1.80
Rural	2.98	4.22	3.69	2.31	1.90

Source: NFHS 3 (Data for total fertility rate was unavailable for Jharkhand from NFHS 2).

These nuances in the fertility profile are rampant throughout the country, and make it difficult to explain India's fertility decline using conventional fertility transition theories. A historical investigation of fertility in India highlights the intricacies underlying the fertility trends across the states and the challenges therein of identifying

the fertility determinants for India. For instance, Kerala was the first state that started

showing fertility declines in the 1960s; at a time when it had low economic indicators but

high social development indicators namely high female literacy (James, 2011). The case

of Kerala fuelled the hypothesis that social development, especially among women, can

in itself elicit fertility declines in the rest of the country. However, this idea was contested

by fertility declines in Andhra Pradesh and Tamil Nadu from 1980-1990 amid poor social

and economic measures. Patterns similar to that of Andhra Pradesh and Tamil Nadu were

observed in later instances of fertility declines in other states as well (James, 2011).

These heterogeneous fertility trends throughout the country were critically examined in

the seminal work by Dyson and Moore (1983), who elucidated the complex interplay of

historical, economical and sociocultural systems underlying the northern and southern

regions as the foundations for their fertility differences. The authors argue that the

specific cultural traditions distinct to each region are rooted in these systems of historical

traits (Muslim invasion in the north vs. Christianization in the south), agricultural

economies (dry cereals in the north vs. rice in the south) and kinship system (exogamous

in the north vs. endogamous in the south); and it is these systems that are largely

responsible for the pathways to fertility change (Dyson & Moore, 1983).

India thus presents itself as an intriguing anomaly in fertility transition theory,

leading to ample literature with many experts attempting to identify the distal and

proximal factors contributing to its fertility decline. In an effort to interpret the country's

versatile demographic change, Guilmoto et al (2004) explored the contributions of

measures under the following overarching groups: economic development, social

structure, women's status and health infrastructure. Of these distal determinants, the study findings suggested that health infrastructure and economic development played a modest role in explaining fertility; while women's status was systematically linked with low fertility. Additionally, religion, as a component of social structure, was associated with fertility in that Muslims and Christians had a higher fertility than the average. This relationship was suggested to be mediated by differentials in contraceptive use by these religious minorities compared to Hindus (Guilmoto & Irudaya, 2005) with other studies finding similar religious patterns in contraception use (Jejeebhoy & Sathar, 2001) (Morgan, Stash, Smith, & Mason, 2002) highlighting the importance of the sociocultural context for family planning.

Other explanations for driving the aggregate fertility declines over the past decades have been linked with increasing shifts in knowledge, attitudes and practices of family planning. This includes a pivotal change in fertility goals among illiterate women (James, 2011) with a decrease in the number of children desired per woman from 3.2 in 1992-1993 to 2.2 in 2005-2006 (NFHS 3). Additionally, the adoption of irreversible contraceptive methods at younger ages in the reproductive life-course (James, 2011) coupled with improvements in service delivery of family planning programs especially in southern states (Srinivasan, 1995) are considered important proximal contributors to the declining fertility trends.

2.2 Contraception: Prevalence and Determinants

Despite the contributions of contraception to the decreasing trends in fertility in India, the current contraceptive profile in the country still leaves much to be desired. While the

overall contraceptive prevalence rate (CPR) has risen, albeit with varying degrees across the country, many critical issues continue to prevail. India's contraceptive profile is heavily dominated by non-reversible methods, limited use of male or couple-dependent methods, high rates of discontinuation and a high unmet need for contraception among married and unmarried groups (Santhya, 2003). Moreover, among young rural married women contraception use for delaying the first postnuptial conception or birth spacing is negligible (Chandhick et al, 2003;(Daniel, Masilamani, & Rahman, 2008). The pattern observed for first family planning use in this population suggests that women turn to contraception (often sterilization) only upon achieving a desired family size along with the birth of at least one son (Chandhick et al, 2003;(Daniel, et al., 2008). This pattern of use coupled with an extremely young median age at marriage for females (16.7 years) raises many risks for the mother as well as for the health of her children. Using timely and appropriate contraceptive methods among young rural mothers and delaying first births along with increased birth-spacing can help lower infant and child mortality and increase the mean age of childbearing (Daniel, et al., 2008). Moreover, some experts argue that sterilization alone is not a sustainable means for a continued decline in fertility since majority of women turn to sterilization after achieving a parity of at least three children (NFHS-3; (Rajaretnam & Deshpande, 1994).

The CPR in India is most recently estimated at 56%, with female sterilization accounting for more than two-thirds of contraception use (NFHS-3). Between NFHS-1 and NFHS-3, the CPR increased more in rural areas (16 % points) than in urban areas (13 % points) even though the overall CPR remains still higher for urban India (64% vs.

53%); reflecting the possible success of the NRHM strategy and national focus on rural areas. Unlike the regional variability observed for many health outcomes across India, the dominance of sterilization is a uniform pattern among modern contraceptive users in majority of the states and has held true over time. This is evident in **Table 3** below, which summarizes the contraceptive method mix for the four states of relevance to this study, using the last two NFHS periods. For each state, female sterilization accounts as the dominant method for modern contraception users, regardless of the contraception prevalence rate in that state.

Table 3: Percent distribution of contraception users among married women in four states in India, 1998-1999 and 2005-2006 distinguishing between current users of any contraception method, percent of those using a modern method and percent of modern users that are sterilized.

	All India	Bihar	Jharkhand	Maharashtra	Tamil Nadu
NFHS 2 (1998-1999)					
Any Method	48.2	24.5	-	60.9	52.1
Any Modern Method	42.8	22.4	-	59.9	50.3
Female Sterilization	34.2	19.2	-	48.5	45.2
NFHS 3 (2005-2006)					
Any Method	56.3	34.1	35.7	66.9	61.4
Any Modern Method	48.5	28.9	31.1	64.9	60.0
Female Sterilization	37.3	23.8	23.4	51.1	55.0

Source: NFHS (Data for contraception prevalence was unavailable for Jharkhand from NFHS 2).

Synonymous to the volumes of research and interest regarding India's fertility transition, contraception patterns and related dimensions have also been vastly studied in the literature. Much of this research has focused on identifying the various factors

influencing or inhibiting the uptake of contraception across rural and urban settings through the country. Additionally, there is a regional emphasis in the literature with states such as Kerala and Tamil Nadu as well as Bihar and Uttar Pradesh; often emerging as the setting for most studies. Maharashtra also attracted attention in this area of research as early as the 1980s while the newly-formed state of Jharkhand only appeared as a study setting for contraception-related research in two studies since 2010 (Collumbien, Mishra, & Blackmore, 2011; Santhya et al., 2010). Regardless of regional setting, past research has often focused on exploring the demographic, sociocultural and infrastructural factors influencing contraception uptake.

In several large-scale multivariate studies, demographic factors such as urban residence; belonging to the majority religion and caste; increasing age; higher education; and being employed are found to be associated with contraception use among married Indian women (Srikantan, Mulay, & Radkar, 1992); (Dwivedi & Sundaram, 2000) (Thind, 2005)NFHS 3). However, important nuances emerge within these associations when these relationships are studied in stratified groups. For example, the most recent NFHS data reveals that female sterilization, although the main contributor to modern contraceptive use is higher in rural and less educated masses compared to urban and more educated women. Additionally, public health education through mass media messaging is associated with increased contraception use among less educated women than those with more education (Dwivedi & Sundaram, 2000). Of all demographic factors, the role of female education in contraception uptake has been of particular interest in India, and has been studied by prominent experts in the field (Jeffery & Basu, 1996; Jeejeebhoy, 1995).

While these works conclude that education has an undeniable positive impact on

women's reproductive lives; they also stress that this impact is heavily shaped by the

preexisting kinship structures and gender stratification within communities. Important

work in this area has found that a moderate amount of education in a highly stratified

society with strong patriarchal systems may not result in positive health outcomes to the

extent observed in more egalitarian societies (Jeffery & Basu, 1996; Jejeebhoy, 1995).

Apart from demographic characteristics, sociocultural settings and their influence

on contraception use is another dominant theme in the literature. In a study examining the

influence of inter-spousal communication on contraception in Bihar and Tamil Nadu, the

authors found a positive association for both states; however inter-spousal

communication was more effective in reducing family size in Tamil Nadu (TN) than in

Bihar (Acharya & Sureender, 1996). In another study comparing regional differences in

the linkages between parity, son preference and contraception use; the number of sons

influenced contraceptive use at each parity for Northern India; but this association was

much weaker in Southern India (Jayaraman, Mishra, & Arnold, 2009). Additionally, in a

comparison of spousal perspectives of their wife's autonomy in Uttar Pradesh (UP) and

TN, husbands' perceptions of women's autonomy has a greater influence on their

contraceptive uptake, than women's own autonomy perceptions. This pattern did not hold

true in TN, where women's perceptions had a dominating influence on reproductive

behavior, including contraception (Jejeebhoy, 2002). Similar influences of gender context

were observed in a large-scale five country study by Mason and Smith (2000) where the

husband's fertility preferences had a stronger impact on contraception use in gender-

stratified communities such as some northern Indian states. This body of research illustrates the importance of gender roles and women's status in contraception use and other reproductive health outcomes, beyond the commonly investigated demographic determinants.

Lastly, the availability and quality of services must also be considered as important contributors to contraception practices. Despite laudable advances in the rural health infrastructure in India, a recent nation-wide facilities assessment found inadequacies in trained personnel and stockpiles of reversible contraceptive methods in many rural sites across the country, particularly in Bihar and Uttar Pradesh (Koenig, et al., 2000). Data from the most recent NFHS reveal that only one-third of users were informed about the side effects of their method at the time of adoption of the method, and a quarter were informed on how to manage side-effects (NFHS 3). Moreover, a mere 28% were *ever* informed by a health/family planning worker about other methods they could use in their life course; potentially accounting for the high sterilization prevalence and discontinuation rates of temporary methods (Koenig, et al., 2000). Rural women are especially at a disadvantage given that majority of these women receive family planning services from the public sector (78%), and the public sector is less likely to provide information on informed choice and side effects (NFHS 3; (Koenig, et al., 2000). Another source of discrepancy with regards to service delivery is the previously mentioned geographical pattern within India. In an extensive review of the evidence on quality-of-care within the Indian family welfare program, Koenig et al (2000) found that North Indian states had comparatively lower levels of provider-client interaction and rapport

compared to their Southern counterparts. Interestingly, there were striking similarities in the quality-of-care concerns across India; including matters of method choice, information dissemination and continuity of care (Koenig, et al., 2000), which can all contribute to hampering access to and effective use of contraception.

In summary, the literature validates that contraception practice in India, is embedded within a complex web of demographic, sociocultural and infrastructural layers; which are influenced by forces of changing policy and government priorities. The investigation of these factors in the literature recurrently emphasizes regional variations in key reproductive health outcomes across the country; inherently underscoring the critical function of the gender norms, familial structures and the socioeconomic position of women in their communities.

3. The Role of Women's Autonomy

In the 1980s to the 1990s, a rich body of work emerged in the demographic and social sciences literature to better understand the underlying mechanisms driving the large regional disparities in family planning outcomes and fertility trends in India (Dyson & Moore, 1983); (Basu, 1992); Jejeebhoy, 1995; (N. Kabeer, 1999).This research echoed the key messages from the 1994 Cairo Conference that women's empowerment and gender equality are the cornerstones of population and development programs. By demonstrating the multiplier effects of increased gender equality and promotion of women's rights on familiar development goals at the Conference; there was an increasing interest to better understand and measure the complex construct of women's

empowerment (Kabeer, 1999). With a focus on women's autonomy, the following sections will firstly lend a conceptual understanding of the term; secondly discuss its research operationalization; and thirdly elucidate the autonomy-education-fertility relationship, one that is central to understanding autonomy's influence on reproductive health.

3.1 Conceptual Considerations

It is important to begin by distinguishing between the dominating terminology within the area of women's rights and gender equity. The literature is rife with terms such as women's empowerment, women's status and women's autonomy with a widespread tendency for interchangeable use. Despite the nexus of terms and their diversity of use in this field, a review of the literature reveals overall consensus on conceptualization of the three aforementioned different terms.

Women's empowerment is an intricate process, which Kabeer (1999) has defined as the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them; a definition which is widely embraced in the literature. Empowerment is not considered a state that one can be born into or exist in as a constant throughout life i.e. for a woman to be empowered, there is a precursor for her to have been previously disempowered (Kabeer, 1999). Building on Kabeer's definition of empowerment, a woman's ability to exercise choice is dependent on three related dimensions: *resources* or the pre-existing conditions that enhance or inhibit exercising choice; *agency* or the process of decision-making to act on one's self-defined goals; *achievements* or the outcomes of the process (Kabeer, 1999). In the social science

literature, the construct of autonomy is often reflective of what Kabeer calls "agency" and is considered the essence of the empowerment process. A few authors further distinguish between empowerment and autonomy based on *who* is involved in the process i.e. autonomy implies independent action whereas empowerment may be achieved through interdependence (Malhotra et al, 2002). However, the emphasis on individual decision-making in collectivist societies and settings of strong kinship structures is challenged in the Indian context; thus embracing joint decision-making as a facet of autonomy in India (Dasgupta, 1995a; Mumtaz & Salway, 2009). The second important distinction is the one between autonomy and "women's status". Women's status is associated with a sense of esteem and prestige that is conferred upon her. Factors that determine a woman's status in society are often factors external to the individual while autonomy is linked with their inner sense of agency or the power within (Kabeer, 1999). Additionally, a woman with high esteem or status in society, may still have limited control over her life (Jejeebhoy, 1995); thereby compromising its usefulness as an enabler for positive development and in this research, to influence her reproductive health.

Posited distinctively from empowerment and status, autonomy maybe defined as "the ability to obtain information and use it as the basis for making decisions about one's private concerns and those of one's intimates" (Jejeebhoy, 1995). Within Kabeer's empowerment framework, autonomy can be thought of as the intervening variable connecting the path from one's resources to one's outcomes. Relevant to the family planning context, autonomy would be the facilitator that determines if and how a women

accesses family planning methods to influence her fertility outcomes. Autonomy can be theorized as a multidimensional construct comprised of five key dimensions:

> a) knowledge autonomy: a women's exposure to and her awareness of the outside world; b) decision-making autonomy: the extent to which a woman is involved in family decisions or decisions concerning her own lives and well-being; c) physical or mobility autonomy: the ability to which a woman can interact with the outside world; d) emotional autonomy: the extent to which a woman can enjoy close bonds with her spouse and be free from threats of violence; e) economic and social autonomy: the extent to which a woman has access to and control over her household resources (Jejeebhoy, 1995).

While each of these five dimensions are important contributors to the collective autonomy a woman has, their weighted importance maybe variable by time and setting. The theoretical understanding that autonomy is neither static nor homogenous allows one to appreciate the complexities of its measurement in the literature. In largely patriarchal societies, such as in northern India, autonomy has been found to be low for a newly-married bride and tends to rise with time leading to higher autonomy in older ages. This rise is characterized by factors such as the birth of a son; the growth of these sons until marriage; her eventual assumption of the role of mother-in-law and consequently grandmother (Dasgupta, 1995a).

In India, the determinants of autonomy are also variable insofar that the factors associated with autonomy are largely dependent on the region that is being investigated.

In highly gender stratified Uttar Pradesh, traditional factors associated with status such as co-residence with mother-in-law, size of dowry, age and parity along with economic status are strongly associated with women's autonomy, with little influence of secondary-school education on autonomy. In contrast, for the relatively egalitarian Tamil Nadu, education and employment are found to be the influential determinants of autonomy (Jejeebhoy, 2002).

3.2 Operationalizing Autonomy

In the social sciences literature and public health arena, the interest in women's autonomy evolves around its capacity to potentially influence her own health as well as the health of her family. As previously discussed, an autonomous woman has the power to set her own goals and exercise her right to meet those goals. The basic tenet of theories linking women's autonomy and power in the household to health outcomes is that the greater relative power of women allows them to successfully negotiate for and execute their preferences related to these outcomes within the marriage irrespective of others' preferences (Naila Kabeer, 1994); (Ghuman, Lee, & Smith, 2006; Mason, 1995). This is echoed in findings from a multi-country systematic review of empirical studies investigating women's empowerment conducted by Malhotra et al (2002). The authors found a majority of the studies demonstrated positive influences of autonomy on a range of health outcomes including fertility, contraceptive use, child health and overall women's health (Malhotra, Vanneman, & Kishor, 1995). However, there was a wide discrepancy within the reviewed studies in the way the exposure variables were defined; with some studies using singular measures of autonomy at the household level while

others using aggregate measures at the community level such as female labor

participation or sex ratio of mortality (Malhotra, et al., 1995).

A closer look at the operationalization of autonomy in the literature across time

reveals that earlier studies (1990s and earlier) often used proxy measures for autonomy

such as female education, spousal age-difference or age at marriage. In contrast, majority

of studies over the past decade have built on Jejeebhoy's (1995) dimensions of autonomy

(namely decision-making, financial and physical) at a household level. A possible

explanation for this trend maybe the large-scale availability of autonomy-related

variables resulting from the introduction of women's status and empowerment indicators

in the Demographic Health Survey (DHS) since 1999-2000 (DHS, 2012).

Examining the recent literature specific to rural India, autonomy has often been

measured with an emphasis on individual dimensions at the household level such as her

mobility autonomy and decision-making autonomy for household expenses and her own

personal health (Bloom, Dasgupta, & Wypij, 2001; Mistry, Galal, & Lu, 2009). This

focus on individual agency and independent decision-making for autonomy measurement

however, maybe naïve in a society with strong kinship structures (Dasgupta, 1995a;

Mumtaz & Salway, 2009). Particularly in rural settings, kin relationships (both natal and

marital) continue to constitute the main medium to access information, support and

resources thereby involved discussion with family members or joint decision-making

maybe an asset for these women. In one study, Bloom et al (2001) demonstrated through

their ethnographic work that kinship relationships are a strong determinant of autonomy

in northern India, albeit that even this association is not a homogenous construct. The linkages between a women's control over her decision-making and her kinship structure are mediated by age whereby kinship ties are more crucial in determining autonomy for younger women compared to older women (Bloom, et al., 2001). These nuances in interpersonal relationships thereby demand consideration as an important dimension of autonomy measurement in India (Dasgupta, 1995a; Mumtaz & Salway, 2009).

3.3 Women's Education and Autonomy

In the discussion of women's autonomy and its links to reproductive health outcomes, the role of education is deeply interwoven. Women's education has been globally agreed upon to have a positive impact on population control through a fertility-depressing effect (Moursund & Kravdal, 2003). Education is often posited as causally prior to autonomy in the path to achieving desired health outcomes and is one of the many pathways in which education has a depressive effect on fertility trends over time. Some of the other postulated mechanisms through which education exerts its effects include changing the perceived identity for a woman beyond the role of wife and mother; increasing decision-making within the household and control over resources as well as enhancing inter-spousal communication (Abadian, 1996). Additionally, educated women are more likely to have an older median age of marriage and more likely to use contraception when they have an unmet need, both lending to decreasing fertility (Jejeebhoy, 1995).

Specific to India, the expansion of education has been shown to be responsible for a considerable part of the country's recent fertility decline (Dreze & Murthi, 2001; Jeffery & Basu, 1996). However, there are some important variations to this otherwise steady

relationship between education and fertility, especially in highly gender-stratified and deeply patriarchal societies. It has been found that women's position in society conditions the way and degree to which educational expansion results in changes in reproductive attitudes and behavior (Jejeebhoy 1995; (Moursund & Kravdal, 2003). In such societies, incomplete education can even *increase* fertility (Jejeebhoy, 1995). In a critical examination of the education-fertility-autonomy inter-linkages, Jejeebhoy (1995) asserts that autonomy can mediate the magnitude of the effect of education on autonomy. However, the literature on this pathway remains largely inconclusive with some finding that autonomy has minimal impacts on the education-fertility link (Jeffery & Basu, 1996), while others conclude that it does have an effect (Jejeebhoy, 1995). These discrepancies may stem from the differences in how autonomy is operationalized and the covariates included in the analysis.

4. Studies Examining the Influence of Autonomy on Contraception

A substantial amount of research has examined the role of women's autonomy on a range of health and behavioral outcomes, with a large emphasis on South Asia. Past literature has been building an evidence-base for the positive effect of women's autonomy on a range of health outcomes: fertility and pregnancy care (Abadian, 1996), domestic violence (Koenig et al 2003; (Bates, Schuler, Islam, & Islam, 2004); child morbidity and mortality (Basu & Basu, 1991; Kishor, 1993) and mental health (Patel et al., 2006). To narrow the scope of the literature review as relevant to this research paper, the following section will focus on studies investigating the linkages between women's autonomy and contraception use within India.

Despite an abundance of ecological studies demonstrating links between women's empowerment and fertility and other exploratory investigations regarding contraception practices in India, there are a sparingly limited number of studies distinctively examining the influence of autonomy on contraception use. A comparatively larger body of work prevails for antenatal care and delivery practices (Bhatia & Cleland, 1995); (Bloom, et al., 2001; Pallikadavath, Foss, & Stones, 2004); (Mistry, et al., 2009); (Allendorf, 2010) as outcomes of interest, using comparable measures of autonomy across these studies. In contrast, the author found only five studies (Dharmalingam & Morgan, 1996; Jejeebhoy, 2002; Moursund & Kravdal, 2003; (Chacko, 2001; Morgan, et al., 2002) that empirically examine the autonomy-contraception link in India; and these are marked by varying methodologies for autonomy-measurement as summarized in **Table 4** below.

< Insert Table 4>

Of these studies, all but one study (Jejeebhoy, 2002) investigated autonomy as the primary exposure of interest; while Jejeebhoy examined contextual influences, namely inter-spousal divergence on *perceptions* of the wife's autonomy, and it's influence on reproductive behaviors. With the exception of Chacko's study (2001), which used qualitative methods (participant observation, focus group discussions and key-informant interviews) to elucidate the contextual factors influencing contraception, the remaining four studies employed quantitative methods. These four studies build on the multidimensional understanding of autonomy (Jejeebhoy, 1995) by creating different autonomy indices (Dharmalingam & Morgan, 1996; Jejeebhoy, 2002; Moursund &

Kravdal, 2003; (Chacko, 2001; Morgan, et al., 2002) for each dimension of the authors'

interest. A comparison of the dimensions investigated reveals that all four studies

measured mobility autonomy and three of these also used some measure of economic

autonomy. Morgan et al (2002) and Moursund & Kravdal (2003) incorporated an

additional element of "emotional autonomy" gauging the quality of spousal relationships.

While the former study created an index based on attitudes around and experience of

domestic violence, the latter only focused on attitudes towards domestic violence.

Recognizing these methodological differences in the studies reviewed lends some

understanding to their varied findings. Only one study found a significant and

independent effect of all individual-level autonomy measures on contraception uptake;

even in the presence of factors such as education and employment (Dharmalingam &

Morgan, 1996).With respect to the other studies, each had a distinctive finding regarding

specific dimensions of autonomy that proved to have a strong influence on contraception.

Morgan et al (2002) and Moursund & Kravdal (2003) both demonstrated the importance

of community-level aggregates of autonomy on contraceptive behavior wherein both

studies found significant increases in probability of contraception use in areas with higher

freedom of movement (Morgan et al, 2002; Moursund & Kravdal, 2003) and higher

emotional autonomy (Moursund & Kravdal (2003). On an individual level, economic

autonomy was the only dimension significantly associated with increased probability of

contraception use (Moursund & Kravdal; 2003). The importance of economic autonomy

is also validated in Jejeebhoy's findings (2002), where women's reports of access to

resources, exerted a strong influence on contraception uptake in both comparison study

states of Tamil Nadu and Uttar Pradesh. While contraception use in Tamil Nadu was significantly and positively influenced by Tamilian women's reports of their mobility autonomy as well; women's reports of economic autonomy was the only dimension that emerged as a positive influencer for Uttar Pradesh. In contrast, women's reported decision-making autonomy was negatively associated with contraceptive uptake in both states; an unexpected finding that wasn't explained by the authors (Jejeebhoy, 2002). Regardless, the study highlighted the importance of contextual setting wherein for a more egalitarian society like Tamil Nadu, women's autonomy perceptions are central to contraceptive use; while in patriarchal Uttar Pradesh, the husbands' perceptions of their wives' autonomy proved more influential on contraceptive use (Jejeebhoy, 2002). Finally, in Chacko's qualitative assessment of the determinants of contraceptive use, the author found that restricted mobility and limited involvement in decision-making emerged as important themes when identifying barriers to use. Moreover, perceptions of a woman's role merely as a child bearer was entrenched among the husbands in the study community; and led them to stigmatizing and reprimanding their wives if they considered using modern contraceptive methods. Facing such negative attitudes towards contraceptive use, few women turned to use contraception, and those who did often underwent sterilization without the knowledge and permission of their spouses (Chacko, 2001). While these are critical themes underscoring the pathways in which autonomy can mitigate barriers to a woman's right to her reproductive health, the qualitative methodology and sampling approach used was not clearly defined in the study; raising concerns on the validity and quality of these results.

Synthesizing the findings from the studies discussed above, it is apparent that the influence of autonomy, as a holistic construct, on contraceptive behaviors is varied and inconclusive. The lack of standardization of measuring autonomy among these studies, and in the overall literature, makes it difficult to compare their findings across the research spectrum. Although the authors try to elucidate their operationalization for each autonomy dimension, the methodological rationale in the creation of the autonomy indices are often skimmed over. For instance, in the three studies that investigated physical autonomy (Jejeebhoy, 2002; Moursund & Kravdal, 2003; (Chacko, 2001; Morgan, et al., 2002); there were variations in how the freedom of movement scales were operationalized. Moursund & Kravdal and Morgan et al allotted scores to women if they could visit places (health center, market, family homes) without permission, while Jejeebhoy allotted scores if they could visit similar places without an escort. Although these studies emerged within the same time frame in the literature (2002-2003), there are still discrepancies in measurement of the same construct highlighting the lack of empirical consensus in this area of research. Jejeebhoy's emphasis on unescorted travel as a measure of physical autonomy rather than permission-free travel maybe contentious in societies where safety concerns, rather than autonomy, could drive mobility practices. Furthermore, a dichotomous score for mobility autonomy based on the need for permission to visit places disregards those women who have extremely limited mobility and are not allowed to leave the house, a common practice in patriarchal rural Indian settings (Chacko, 2001). This group of women could potentially have a distinctive relationship between their autonomy and reproductive health, compared to those needing permission but still allowed to visit places of interest. Another inherent problem with the

previous studies' measures of mobility lies in its assumption that those women who need permission to visit places are less autonomous than those that do not; undermining the strong kinship structure in India. In a culture of strong familial ties and a deep respect for elder members in the household, asking permission to leave the household may not so much be a function of autonomy as much as a reflection of the cultural norms. This further underscores the need for a third comparison group (women who are not allowed to leave the house) as mentioned before to examine the varying levels of autonomy.

Additional issues arise in operationalizing the decision-making scales across the three studies reflecting varying perceptions of which aspect of decision-making is considered more important to the authors. Two of the studies (Jejeebhoy, 2002; Morgan, et al., 2002) emphasize the degree of say in household decisions by including components that delineate if the woman has greater say in that decision, compared to other household members. While Moursund and Kravdal (2002) also measure decision-making, their scale is based on the level of a woman's involvement either jointly with her spouse or other family member, or independently. Moursund's approach is more commonly found in contemporary studies measuring the effect of decision-making autonomy on reproductive health outcomes in other countries (Al Riyami, Afifi, & Mabry, 2004; Laurie F. DeRose & Ezeh, 2009); (Mistry, et al., 2009) and maybe attributed to their use of common secondary data sources such as the Demographic Health Survey with similar measures of autonomy available to them.

A further critique of the studies reviewed is the lack of regional comparisons in their analysis. Given the widespread appreciation of the regional influence on autonomy and consequently on its health outcomes as previously discussed, there are limitations to fully realizing the implications of a study's findings if it is only focused on one geographical unit within India. Apart from Jejeebhoy (2002) and Morgan et al (2002), both comparing their study hypotheses in Tamil Nadu and Uttar Pradesh; the other studies were specifically based in one state namely Tamil Nadu (Dharmalingam, 1996) and West Bengal (Chackho, 2002). Moursund and Kravdal (2002) used the NFHS-2 for their analysis but did not investigate regional differences in their research.

Finally, all studies reviewed entail cross-sectional analyses of the linkages between autonomy and contraception uptake. This cross-sectional study design assumes a static nature of autonomy when it is has often been suggested that a woman's autonomy in India changes over her life-course (Dasgupta 1995; Lee-Rife 2010). In a traditional Indian setting, a women's autonomy is known to change with age, birth of sons and changes in household position from daughter-in-law to mother-in-law (Dasgupta 1995; Lee-Rife 2010). Without an understanding of the changes in autonomy over time and how those changes can shape reproductive health outcomes, there is a risk of not only compromising a thorough understanding of these linkages but also missing out on potential areas of intervention. Moreover, cross-sectional studies inhibit the ability to establish temporality regarding autonomy patterns and contraceptive use.

5. Summary of Literature Review

While there are rich and abundant theoretical discussions linking women's autonomy and reproductive health in the literature, there is a surprisingly limited volume of research on the empirical associations between autonomy and contraceptive use in India. Considering the existing studies, the relationship between autonomy and contraception uptake is largely positive albeit with important nuances, often shaped by study setting and methodological factors. There has been a lack of consensus on operationally defining autonomy, with a tendency to emphasize women's individual freedoms without recognizing the strong kinship structures prevalent in India and the need to contextualize those measures. Moreover, there is a dearth of regional diversity in the research, which is an important aspect for research pertinent to India and elicits a need for state-stratified research, beyond the conventionally used Uttar Pradesh and Tamil Nadu dichotomy. Additionally, most of the existing research is based on cross-sectional data despite the recognition of autonomy as a dynamic concept in the South-Asian setting. To summarize, future research in India should prioritize investigating the effects of *dynamic* autonomy on contraceptive practices and attempt to study this relationship across socioeconomically diverse states.

CHAPTER III: METHODS

1. Study Objectives

The objective of this study is to examine the associations between dynamic autonomy and contraception uptake in four distinct states in India: Bihar, Jharkhand, Maharashtra and Tamil Nadu. There are two primary research questions that this study aims to address in an overall sample as well as state-specific samples:

1) What are the patterns of autonomy changes?

2) How do changes in autonomy influence contraception uptake?

2. Study Setting

Figure 2: The four study states highlighted on the map of India

Bihar

Situated in the northern part of India, the densely populated state of Bihar remains a laggard in socioeconomic development compared to the rest of the country. According to the Indian government's Human Development Index, Bihar has shown minimal progress on a variety of indicators including poverty rates, infant mortality rates, life expectancy, and literacy; continually ranking last of all states, since 1981 (NHDR, 2001). Bihar's tumultuous political history rampant with a corrupt government is widely known to have contributed to its poor health and social profile (Daniel et al, 2008). The region's economy depends largely on traditional agriculture and most people live in rural areas with a deeply rooted caste system. With this backdrop, women in rural Bihar are extremely marginalized with limited access to resources and limited control over their own health.

Jharkhand

Jharkhand was recognized as the 28th state of India in November 2000 where it split from its former adjunct state of Bihar. The separation came after a long period of demands exerted by the tribes of the region, which constitute majority of the population, for an independent state that recognizes its unique cultural identity. As a state carved out of Bihar, Jharkhand initially shared similar characteristics to Bihar on many socioeconomic fronts: low average income, high incidence of poverty and little social development. Additionally, the urban-rural gap in this state is more profound; with Jharkhand having the highest percentage of rural poor in the country (49%) in 2000 (Sen & Khanna, 2007). Responding to this, there has been state and non-governmental efforts to reduce the degree of income inequality and rural poverty through an inclusive economic plan that balances growth in the agricultural and mining sector. Between 1994-2002, the state has

shown an impressive decline in poverty by two percentage points a year, improvement in access to primary education and increased coverage of childhood immunization (Sen & Khanna, 2007). Recently, Jharkhand is thought to be in the midst of a critical path to reach its socioeconomic potential and is subject to attention from key development and health experts.

Maharashtra

Maharashtra, a coastal state in the western part of India, is the third largest state in the country with regards to population and size. The state has a population density higher than national average and its population rate continues to grow at a much faster rate than the national one (Ministry of Health and Family Welfare, 2012). Compared to Bihar and Jharkhand, Maharashtra is regarded as one of the progressive states in the country with better economic and social development. Compared to national estimates, Maharashtra has a higher percentage of households with electricity, drinking water, literate and employed women (Barua & Kurz, 2001). In 2001, Maharashtra ranked fourth of all states in the human development index (NHDR, 2001).

Tamil Nadu

Situated in the southern tip of India, Tamil Nadu is the 11th largest state in India and constitutes over 6% of the country's population (Census 2001). Tamil Nadu is widely recognized as one of the most developed states in India with high levels of economic and social growth. Tamil Nadu fares better than national average in literacy, employment and per capita income rates (Census, 2011). The state's tremendous progress in the last decades have bumped its ranking on the Human Development Index from seven in 1981 to three in 1991, where it has remained constant (NHDR, 2001).

3. Data and Study Population

There were two primary data sources used in this study. The first data source used was

the 2nd National Family Health Survey (NFHS-2) conducted in 1998-1999 by the

International Institute for Population Sciences (IIPS) and Macro International. The NFHS

is a nationally representative household-level survey for India that is equivalent to the

Demographic Health Survey (DHS) used in other countries. The NFHS-2 includes a

women's questionnaire collecting data on topics such as fertility, family planning,

nutrition, maternal and child health, among others. The NFHS-2 sample ultimately

included a total of 89,199 reproductive aged (15-49 years) women residing in 91,196

households across 26 states. Details on the data collection procedure for the NFHS-2 can

be found elsewhere (NFHS-2).

The second data source was a follow-up study conducted by IIPS and Johns

Hopkins Bloomberg School of Public Health (JHSPH) in 2002-2003 in four Indian states:

Bihar, Jharkhand, Maharashtra and Tamil Nadu. This data collection was limited to

married rural women who were usual residents of the household at the time of the 1998-

1999 NFHS-2 interviews. High re-interview rates were achieved in all four states,

ranging from 76% in Maharashtra to 94% in Tamil Nadu. With the exception of lower

levels of baseline contraceptive use and prevalence of domestic violence in Bihar and

Tamil Nadu, the re-interviewed and non-re-interviewed samples of women were

generally similar in characteristics, indicating no significant selectivity in the re-

interviewed sample. The final sample size for the follow-up survey in 2002-03 was a total

of 6,303 rural women.

Given that the primary outcome of this study was the inter-survey adoption of contraceptive use, the sample for analysis was revised accordingly. Based on the contraception-related data measured at baseline for all 6,303 women, those who reported using any contraceptive method (oral pill, IUD, injection, condom, male/female sterilization, periodic abstinence, withdrawal and other methods) were excluded from the analysis (n= 2,192). Additionally, those who reported having a hysterectomy as the main reason they were not using contraception at follow-up were also excluded from the analysis (n= 170). Lastly, those women missing contraception related information at follow-up were excluded from the analysis (n=331). The final sample thus consisted of women who were non-contraceptive users at baseline, were considered eligible for inter-survey contraceptive adoption and had contraception related information available at follow-up; resulting to a total sample size of 3,610 women.

4. Measures

4.1 Women's Autonomy

The primary exposure of interest for this study- women's autonomy, was measured using similar questions at baseline (NFHS-2) and follow-up (JHSPH and Macro International). Autonomy was measured using three dimensions- financial autonomy, mobility autonomy and decision-making autonomy. Financial Autonomy was created as a binary variable based on whether respondents were allowed to set money aside in their house for them to use as they wished. Those who responded "yes" were categorized as having high financial autonomy and those who responded "no" were categorized as having low financial autonomy. Mobility autonomy was measured using two items: a) whether the respondent needed permission to go the market b) whether the respondent needed

permission to go visit friends/family. For each item, scores were assigned as follows: "0"

if respondent was not allowed to go, "1" if they needed permission to go and "2" if they

did not need permission to go. A scale (ranging from 0-4) was then created by summing

the scores for each respondent for both items. Finally, those scoring between 0-2 points

were classified as having "low mobility autonomy" and those scoring between 3-4 points

were classified as having "high mobility autonomy". Decision-making autonomy was

measured based on respondent's involvement in decision-making on three items: a)

seeking healthcare for herself b) purchasing jewelry c) staying with natal kin.

Respondents who reported being involved in decision-making (independently or jointly

with a family member) were assigned a score of "1" and those who reported no

involvement in decision-making were assigned a score of "0". This scale was created

differently compared to past measures of decision-making, which ranked independent

decision-making higher than involvement in decision-making. Recognizing the strong

kinship structure in India and contesting the tendency to use western standards of

autonomy for decision-making, this study considered joint decision-making just as

important as independent decision-making in a rural household. Thereafter a decision-

making scale (ranging from 0-3) was created based on the sum of scores for all three

items and further dichotomized with those scoring "0" as "low decision-making

autonomy" and all others (1-3) as "high decision-making autonomy".

The above steps were used to create the three autonomy measures for both,

baseline and follow-up periods. A critical aspect of this study was to account for the

dynamic nature of women's autonomy in India and measure the changes in autonomy

through the inter-survey period. Thus, three new categorical variables (one for each dimension- financial, mobility and decision-making) were created to measure the changes in autonomy from baseline to follow-up. Each variable measuring autonomy change comprised of the following four categories: (a) *"Low at Both":* respondent had low autonomy at baseline and at follow-up (b) *"Decreased"*: respondent had high autonomy at baseline but low autonomy at follow-up (c) *"Increased":* respondent had low autonomy at baseline but high autonomy at follow-up and (d) *"High at Both":* respondent had high autonomy at both baseline and follow-up. Accordingly, there were a total of three new variables measuring changes in financial, mobility and decision-making autonomy, with four categories each, serving as the primary exposures of interest for this study.

4.2 Study Covariates

Several other covariates of interest, known to be associated with contraceptive use, were also adjusted for in this study (Dwivedi & Sundaram, 2000; Santhya, et al., 2010). Age was measured as a categorical variable with five levels: <24 years, 25- 29 years, 30-34 years, 35-39 years and those > 40 years. Education and employment were measured dichotomously ("literate/illiterate" and "employed/unemployed"). The standard of living index was calculated according to the respondent's answers regarding: living in a home with electricity, toilet facility, a refrigerator, source of drinking water, and ownership of car, motorcycle, radio, or television. The answers were summed to create a scale (0-12), which was then categorized as low, medium and high. Economic conditions over the past four years were self-reported at follow-up and categorized as "same", "better" or "worse". Religion reported at baseline was dichotomized as "Hindu" or Non-Hindu (includes Muslims, Christians and Others). Caste reported at baseline was categorized as

one of three: scheduled caste or scheduled tribe (SC/ST), other backward class (OBC), or Other. A continuous variable was created based on the difference between respondent's age and spouse's age at follow-up to measure the spousal age-difference. Based on the reported number of children ever born per respondent, parity was categorized into three levels: 0-2 children, 3-4 children or more than five children. The number of sons was measured based on the reported number of sons living at home and categorized as none, one, two, three and four or more sons. Experience of physical violence was measured based on reported recall of physical violence from husbands in the year preceding the follow-up survey. A considerable percentage (over 10%) of respondents did not answer this question and were categorized as a separate group since assumptions cannot be made about their physical violence experience based on non-response. Thus, there were three levels for the categorical variable measuring physical violence: experienced physical violence, did not experience physical violence, and those that did not respond or were missing data. Finally, recognizing the socio-cultural differences across states as discussed previously, a variable including state of residence was also included. The primary outcome of this study, contraception use, was assessed based on respondent's reporting of current contraceptive use at follow-up. Thus, a dichotomous outcome for contraception use, defined as "yes" or "no" was used in this analysis.

5. Analysis

First, bivariate analyses were used to analyze the distribution of the socio-demographic characteristics and autonomy measures across the different states. Second, unadjusted odds ratios and 95% confidence intervals were calculated to explore patterns of contraceptive use by each study covariate. Next, multiple logistic regression models were

used to estimate the effects of women's autonomy over time on inter-survey

contraceptive adoption adjusting for all other covariates[2]. To examine state-specific

effects of autonomy on inter-survey contraceptive uptake, pooled models using all

covariates were also fitted for each state using state-stratified samples. All data analysis

was conducted using STATA version 11. Any missing data were excluded from analysis

except for in the case of physical violence as described previously.

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[2] Employment was excluded from the logistic regression models because in the exploratory analysis it did not influence the parameter estimates and decreased the parsimony of the model.

CHAPTER IV: RESULTS

1. Demographic and Socioeconomic Patterns

Demographic characteristics are summarized in **Table 5** for the overall sample and by

state. Overall, more than half of the sample of women (56%) was less than 30 years of

age and had a mean difference of five years compared to their spouses' age. Most of the

sample reported being Hindu (85%) and belonging to another backward class (52%). The

economic conditions for the sample were fairly consistent across the states. Using the

standard of living index, the largest proportion of all women reported a low (58%)

standard of living along with no changes in their economic conditions over the past four

years (48%). In terms of reproductive characteristics for the overall sample, a similar

proportion of women reported having 0-2 children and 3-4 children (36% respectively).

State-specific descriptive findings are described in detail below.

<p align="center">*< Insert Table 5>*</p>

Of the total sample of 3,610 women, majority of respondents were from Bihar

(n=1932) followed by Tamil Nadu (n=721), Jharkhand (n=558) and Maharashtra

(n=399). The economic patterns observed in the overall sample were reflected across all

states except for Tamil Nadu wherein the majority reported a medium standard of living

(46%) and a decline in their economic conditions (45%) over the three-year follow-up. In

contrast, educational patterns were more irregularly distributed across states. An

overwhelming majority (73%) of women reported being illiterate; however this was

largely driven by the illiteracy rates in Bihar (81%) and Jharkhand (81%) respectively.

This was starkly different from the other states with much higher literacy prevalence in Maharashtra (46%) and Tamil Nadu (45%) respectively.

Examining parity across states reveals variations in the number of children reported per woman. For Maharashtra and Tamil Nadu, over 80% of women had less than four children while the number of children was more evenly distributed across the parity levels in Bihar and Jharkhand. The reported number of sons at home shared more similarities across states; where majority reported having either one or two sons at home. The presence of more than four sons was negligible in Maharashtra and Tamil Nadu (0.5% and 1%) compared to Bihar and Jharkhand (8% and 5%). Lastly, experience of physical violence was surprisingly highest in Tamil Nadu (27%), followed by Jharkhand (26%), Bihar (18%) and Maharashtra (14%).

Contraception uptake during the inter-survey period measured by contraceptive use at follow-up, was approximately 28% for the overall sample. Maharashtra had the highest number of women reporting contraceptive use (58%), closely followed by Tamil Nadu (41%) while Bihar and Jharkhand had comparatively much lower reported prevalence at approximately 19% each. The contraception method mix is summarized in **Table 6**, which illustrates the dominance of sterilization as the main contraceptive method used across states.

< Insert Table 6>

2. Autonomy Distributions and Trends Across States

Distribution of the autonomy dimensions at the two data collection time points are summarized in **Table 7,** for the overall sample as well as for each state. In the overall sample, the prevalence of high autonomy at follow-up was greater than the baseline prevalence for each dimension i.e. a higher proportion of women at follow-up were classified as having high autonomy. These gains over the inter-survey period were the greatest for mobility autonomy (30 points); followed by decision-making (11 points) and financial autonomy (2 points).

<Insert Table 7>

Financial autonomy was relatively high for the overall sample with the smallest change over the two time points, compared to the other autonomy dimensions. For both baseline and follow-up, over 60% of women were classified as having high financial autonomy. For **decision-making autonomy**, the overall baseline prevalence was 59% and increased to 70% at follow-up. Comparing the distribution across the three items used to measure decision-making; there did not appear to be much variation in autonomy related to decisions for healthcare, jewelry purchases or visiting family, at both time-points. **Mobility autonomy** had the most inter-item variation in responses, based on if women were going to the market or to visit people. At baseline, majority of women reported needing permission to go to the market (62%) and to visit family/friends (74%). While this pattern largely prevailed for visiting the market at follow-up (50%), only 36% of women reported needing permission to visit families at follow-up. Compared to market visits, women appeared to have more mobility for visiting family. Lesser proportion of women were not allowed to visit family at baseline and follow-up (3% and 4% respectively) compared to going to the market (9% and 13%). The prevalence of high

mobility autonomy was relatively low at baseline (31% of respondents), but rose to 61% at follow-up.

The state-specific variations for the autonomy distribution at the two-time points (see Table 7) and the striking trends over time (Figure 3) for each state are outlined below.

< Insert Figure 3>

Bihar

Overall, women in Bihar had higher autonomy at follow-up compared to baseline for all dimensions with the exception of financial autonomy. When examining the trends for these autonomy dimensions (Figure 3), based on changes in autonomy for the women over the inter-survey period, interesting patterns emerged. Financial autonomy appeared to be relatively stable over the inter-survey period with the majority of women having high autonomy at both points (38%). For those women whose financial autonomy changed; more women (24%) reported losing their autonomy through the inter-survey period than they reported gaining it (20%). Mobility autonomy appeared to make positive advances in Bihar over the inter-survey period, with 43% reporting high mobility at follow-up when they reported low mobility at baseline. However, about 44% of women reported low mobility autonomy at both time points. Decision-making autonomy had the most varied responses in Bihar, with considerable proportions of women distributed across the four categories of autonomy change.

Jharkhand

In terms of autonomy distribution, Jharkhand fared better than Bihar on all three dimensions (Table 7). Overall, high decision-making autonomy was the most prevalent at baseline and follow-up among the women of Jharkhand (79% and 82%); followed by

financial autonomy (59% and 73%) and lastly, mobility autonomy (38% and 61%). When considering the trends in autonomy over the inter-survey period (Figure 3); decision-making was the most stable dimension in Jharkhand with over 65% of women reporting high autonomy at both points. Similar patterns were reflected for financial autonomy; with 42% having high autonomy at both points and over 30% gaining autonomy over the inter-survey period. Women in Jharkhand appear to have limited mobility; with this dimension having the highest proportion of women with low autonomy at both points (28%) compared to decision-making and financial autonomy. Nonetheless, this dimension also showed the most gains in autonomy with about 34% of women reporting increases in their mobility to visit the market and their family.

Maharashtra

Overall, Maharashtra fared moderately well on the autonomy prevalence at both time points (Table 7). While the proportion of women reporting high autonomy for finances and mobility increased at follow-up; the prevalence of high decision-making autonomy decreased slightly over the inter-survey period in Maharashtra from 59% to 56%. When examining the trends of autonomy changes (Figure 3), financial autonomy and decision-making autonomy appeared to have similar patterns. For both dimensions, at least one-third of women reported high autonomy at both points. However, more women reported losing decision-making over time (23%) compared to women losing financial autonomy (15%). Mobility autonomy was the least prevailing autonomy measure for Maharashtrian women; with the majority (37%) reporting low mobility autonomy at both points and only 18% reporting high mobility at both points. For those whose mobility changed over the inter-survey period, more women gained (32%) than lost (13%) their mobility autonomy.

Tamil Nadu

Tamil Nadu had the largest proportion of women reporting high autonomy for all three dimensions at both time periods (Table 7). Moreover, these high prevalence rates were largely comprised of women who consistently reported high autonomy over time, as illustrated in the graphs for Tamil Nadu (Figure 3). Less than 10% of women reported low autonomy levels at both points, for all the dimensions. Apart from those who had static levels of autonomy through the inter-survey period, more Tamilian women gained autonomy compared to those who lost autonomy and this pattern held true for each dimension. These gains were the greatest for mobility autonomy (25%), followed by financial autonomy (19%) and finally decision-making autonomy (17%).

3. Autonomy and Contraception Uptake

Table 8 displays the unadjusted odds ratios from the bivariate analysis of contraceptive uptake with each exposure of interest i.e. autonomy dimensions and other socioeconomic measures.

< Insert Table 8>

Compared to women who had low financial autonomy at both points, women who gained autonomy over time were more likely to use contraception (OR= 1.58, 95% CI:1.22-2.03) as were women who had high financial autonomy at both time points (OR= 1.50, 95% CI: 1.19- 1.88). The same pattern is observed with mobility autonomy; women who retained high autonomy through the inter-survey period (OR= 1.75, 95% CI: 1.44-2.12) and those women who gained mobility through the survey period (OR= 1.22, 95% CI: 1.02-1.46) were more likely to use contraception. For decision-making autonomy, only high decision-making autonomy at both time-points was associated with contraceptive

uptake (OR=1.39, 95% CI: 1.01-1.76). The use of contraception was not significantly different for those whose decision-making decreased or increased over time. All of the other confounder variables were significantly associated with contraception uptake.

Table 9 presents the results of the pooled model from the multivariate logistic regression for autonomy dimensions with contraception adjusted for all other confounders. In the final model, only one level of financial autonomy retained an independent association with contraceptive uptake; among all the autonomy dimensions. Women who gained financial autonomy were significantly more likely to use contraception [OR=1.55 95 % CI= 1.15-2.09] than those who had low autonomy at both points. Mobility autonomy and financial autonomy were not significantly associated with contraceptive uptake in adjusted models, although most of their effects were in the expected direction.

<Insert Table 9>

4. State-specific associations between Autonomy Changes and Contraception uptake

Table 10 presents the results from the state-stratified logistic regression models for contraception uptake. Overall, there were many variations across and within states for factors associated with contraceptive uptake. Age, education and number of sons were the only covariates found to have a consistently significant association with contraceptive uptake across all four states.

< Insert Table 10>

In Bihar, when controlling for other socioeconomic covariates, none of the autonomy dimensions appeared to be significantly associated with contraception. Age,

education, religion, standard of living, parity, number of sons and experiencing physical violence were significant predictors of contraceptive use for women in Bihar. Bihar was the only state for which women's experience of physical violence was significantly associated with contraception wherein physical violence led to a 50% decrease in contraception uptake [95% CI= 0.34- 0.75].

In Jharkhand, an unexpected finding was the significantly higher use of contraception among women who reported losing mobility autonomy over the inter-survey period compared to those who had low autonomy over time [OR= 2.93, 95% CI: 1.11-7.70]. The final model for Jharkhand found many of the same covariates (as Bihar) to be significant predictors of contraception with the exception of standard of living, parity and experience of physical violence, which did not reach significance for Jharkhand. Jharkhand was the only state for which spousal age difference was found to be significantly associated with contraception use [OR= 0.93, 95% CI= 0.87-0.99].

Maharashtra was the only state for which an autonomy dimension retained its significant association with contraception use in the expected direction. Women in Maharashtra who had high decision-making autonomy at both points were more than twice as likely to use contraception compared to those with low decision-making autonomy at both points (OR=2.67, 95% C=1.19-6.00). Additionally, socioeconomic covariates such as caste and experience of physical violence did not retain significant associations in Maharashtra. An unexpected finding was that Hindus in this state were

less likely to use contraception than non-Hindus (OR= 0.34, 95% CI= 0.14- 0.82), a relationship unique to Maharashtra.

Finally, for Tamil Nadu, as with Bihar and Jharkhand, there was no significant association between the autonomy dimensions and contraceptive uptake. For women in Tamil Nadu, age had an interesting effect on contraception. The odds of contraceptive uptake decreased progressively with increasing age-groups: 30-34 year old women were half as likely to use contraception [95% CI= 0.30-0.89]; 35-39 year old women had a 78% decreased odds [OR=0.22, 95% CI= 0.11-0.44] and those over 40 years had a 95% decreased odds of adopting contraception [OR=0.06, 95% CI= 0.02-0.18]. Unlike all other states, religion was not significantly associated with contraception uptake in Tamil Nadu.

A note has to be made regarding the wide confidence intervals observed for certain measures such as the number of sons in Jharkhand and Maharashtra and the mobility autonomy dimensions for Tamil Nadu, which may be a result of the high variance in responses for those measures.

CHAPTER V: DISCUSSION

With a dearth of research quantitatively examining the relationships between *changing* autonomy and its influence on contraception uptake in India; this study explored these linkages within a sample of rural women residing in four diverse states in India (Bihar, Jharkhand, Maharashtra and Tamil Nadu). This study found large changes in all three autonomy dimensions over the two time periods, underscoring autonomy's dynamic nature and challenging the notion that it is a static construct. Of the three autonomy dimensions investigated (mobility, decision-making and financial), increased financial autonomy was the only one significantly associated with contraception uptake, though some state-specific variations were observed. Of note, in the state-specific autonomy dimensions, the prevalence of high decision-making autonomy and financial autonomy was relatively high among Jharkhand participants at both time points. Due to a lack of prior autonomy-related research in the comparatively new state of Jharkhand, these results warrant further investigation while contributing to important baseline data for this state. Other key study findings and their implications are discussed in detail below.

Autonomy as a dynamic construct

The findings of this study respond to the call made by past researchers for incorporating the dynamic nature of autonomy in its measurement (Dasgupta, 1995b; Lee-Rife, 2010). The cross-sectional nature of the bulk of prior research undermines that autonomy is time-varying and can be shaped by the accumulation of experiences, resources and achievements (Lee-Rife, 2010). The rise and fall in the autonomy dimensions in this

study sample reflects this variable nature of autonomy. Furthermore, examining the

autonomy trends over the study period in the four different states, demonstrates the

regional variability in autonomy patterns across diverse sociocontextual settings.

Autonomy trends were also found to be highly variable based on the dimension of

autonomy investigated, and these variations differed by state. In Tamil Nadu, high

autonomy was found across all three dimensions as well as over time, reflecting the more

favorable gender norms that prevail in Tamil Nadu, which have also been discussed in

other studies (Jejeebhoy, 1991, 2000). In contrast, Bihar showed relatively low levels of

autonomy with minority of women reporting high autonomy levels at both points of the

study.

The Role of Financial Autonomy

Financial autonomy was the only dimension that exerts the strongest independent

influence on adopting contraception, while changes in the other dimensions did not prove

to significantly predict contraception use. The significance of financial autonomy is

echoed in other studies investigating individual autonomy levels and contraception in

India. Jejeebhoy (2002) and Moursund and Kravdal (2003), both found economic

autonomy to be the only individual-level dimension to be significantly associated with

contraception in the presence of other confounders. It is important to note though that

these studies used a static measure of autonomy and also operationalized this dimension

differently. Jejeebhoy's measure of financial autonomy emphasized *access* to resources

using a four-item[3] scale; while Moursund used a two-item measure focusing on women's

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[3] For Jejeebhoy's study (2002), access to economic resources was measured based on whether the woman:
1) has a say in how household income is spent; 2) receives cash to spend; 3) is free to purchase small items.

involvement in deciding how their earned money is spent and access to funds for their

own expenses. Regardless of these methodological differences, increases in a woman's

ability to exercise control over finances at the household level are predictive of increased

contraception use and there are a few pathways that may explain this link.

The first potential explanation for the observed relationship between improved

financial autonomy and contraception is through a pathway mediated by increases in

household wealth. In this study, those reporting increases in financial autonomy also had

the highest proportion of women reporting improvements in their economic conditions

over the inter-survey period; compared to other groups (data not shown). This alludes to

the direct link between overall improvements in household economic status and women's

financial autonomy wherein increases in household financial resources may lead to

increased money set aside for women to access. In contrast, during economically difficult

times for a household, a woman may not have access to funds based on her subordinate

position within a patriarchal household. Given that high economic costs were one of the

main reasons cited for non-use of contraception in this sample, those women with

increased access to funds maybe more likely to tackle these cost barriers to contraception

resulting in higher contraception use among those with increased financial autonomy.

Moreover, if women with increased financial autonomy were also likely to belong to

households with increases in overall wealth; there may be lesser dependence for these

families to fall into the demographic trap i.e. households with increased wealth may not

need to rely on their offspring as economic assets; a practice otherwise prevalent in

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of jewelry; and 4) is free to purchase gifts. A sum of these scores ranging from 0-4 was used as an index for
economic autonomy.

poverty-stricken rural areas (L. R. Brown, 1987). Thus, increased economic autonomy is posited to reduce the need for several children, potentially leading to adopting contraceptive methods (Basu, 1992).

Secondly, increased financial autonomy can lead to positive influences on a woman's psychosocial capacities, indirectly affecting contraceptive behaviors. Past research has found that economic dependence on men underlies women's social insecurity and can negatively influence their fertility (Cain, Khanam, & Nahar, 1979; Schuler, Hashemi, & Riley, 1997). Specifically, lack of access to finances can deter women from adopting contraception due to the perceived risk of side-effects which they fear may require medical expenses that maybe disapproved by their husbands or families. In an analysis of the impact of women's micro-credit programs in Bangladesh, Schuler et al (1997) found that women with increased economic independence were less insecure, less vulnerable to the threat of abandonment by husbands and less fearful of the repercussions of contraceptive side effects; with the program participants being significantly more likely to use contraception than non-participants. These findings suggest that for women with increased financial autonomy in this study, the increased access to funds may mitigate their fear of financial complications of side-effects thereby increasing adoption of contraception.

Lastly, the relationship between increased financial autonomy and contraception uptake maybe mediated by other elements not investigated in this study such as inter-spousal or inter-household relationships. Given that the measure of financial autonomy used in this study is based on a woman's access to resources that she may use as she deems best; one may argue that the likelihood of such access is higher in households

where a woman is respected and trusted, compared to households where she is not. Such

households maybe marked by better inter-spousal relations and communication; which

has in turn been associated with increased contraception use (Jejeebhoy, 2002).

Additionally, the remittance for women to access a pool of resources at the household

level maybe a more valid measure of a woman's agency within her household, than other

measures of autonomy gauged through decision-making involvement. Accordingly,

women who demonstrate gains in their access to finances in the household maybe more

likely to have increased agency which they can exercise for their reproductive health

matters.

The Role of Decision-making Autonomy

In Maharashtra, women who had high decision-making autonomy consistently across

both time periods were significantly more likely to use contraception than those with low

decision-making autonomy at baseline and follow-up. There maybe two possible

pathways explaining this finding. Firstly, women who have a higher involvement in

decision-making at the household level maybe part of households that have more

accepting attitudes towards family planning; thus leading to higher contraception uptake.

The second plausible explanation is pertinent to Maharashtra's socioeconomic indicators.

The sample of women from Maharashtra investigated in this study, had a higher

proportion of literate and employed women, compared to all other states. Past literature

has lent to the understanding that community-aggregates of a woman's position in her

society tend to be more predictive of reproductive health outcomes rather than individual

autonomy levels (L. F. DeRose & Ezeh, 2010; Mistry, et al., 2009). Thus, the higher

proportion of educated and employed women in this sample of Maharashtrian women

may reflect a more favorable environment for women to exercise their decision to use contraception. This posited pathway of community-level aggregates on the influence of individual contraception uptake needs to be explored in future studies.

A couple of unexpected findings emerged from this study. Firstly, decreased mobility autonomy over time in Jharkhand was significantly associated with increased contraception use at follow-up and warrants further investigation for this unpredicted association. Secondly, within Maharashtra, Hindu women were 66% less likely to use contraception compared to non-Hindu women; a result that was not observed in any of the other states where, in fact, the opposite pattern was observed. This maybe attributable to the differences in religious composition across the states. While Muslims and Christians were the main religious minorities for other states, Buddhists comprised the largest proportion of this category in Maharashtra. In the preliminary analyses conducted in the study (data not shown), Buddhists were more likely to use contraception compared to all other groups, and this may partly explain this inverse relationship between Hindus and contraception prevalence in Maharashtra.

1. Limitations and Strengths

The findings of this study must be interpreted in light of some conceptual and methodological limitations. In a context where a permanent method such as sterilization is the most prevalent form of contraception uptake, the role of woman's autonomy remains unclear. With a prevailing pattern in rural India whereby women turn to sterilization upon reaching certain parity often including the birth of at least one son, autonomy's importance amidst such practices maybe disputed. It can be argued that the

role of autonomy may have greater implications when a woman is aware of, and has

access to, non-permanent methods (oral pills, IUDs, etc.) for the benefits of birth spacing

and preventing conception. When supplies of temporary contraceptive methods along

with an enabling environment for informed choice exists, the impacts of autonomy in

influencing contraceptive uptake may potentially be greater than in an environment with

limited contraceptive choice where the primary method is a permanent one. Thus, in the

context that this study is set in, other gender-related indicators namely measuring

preference for sons, attitudes towards girls' education, ideal number of boys vs. girls;

maybe more likely to influence the use of sterilization and further research should

investigate these proposed linkages. The other conceptual limitation is the absence of

community-level measures in this study, including health infrastructure and other supply-

side characteristics, which have been found to be important predictors of service use in

India (Koenig, et al., 2000) (Mistry, et al., 2009). In an analysis by Stephenson and Tsui

(2002) examining the determinants of contraceptive service use in rural India; the authors

found that community-level factors such as the presence of a secondary health facility

and the number of family planning methods available have significant influence on

contraceptive choice. A future analysis including these community-level infrastructural

measures might shed light on the linkages between a woman's autonomy and her

resources at hand to consequently achieve her health outcomes; building on the process

of empowerment theorized by Kabeer (1999).

Some methodological drawbacks of this study also need to be highlighted. Firstly,

although this study made considerable efforts to control for a range of sociodemographic

factors associated with contraception use, there may have been some important variables

that were not included. Past studies have shown that inter-spousal communication is an influential factor for contraception uptake wherein increased communication often leads to positive reproductive health behaviors (Acharya & Sureender, 1996; Mason & Smith, 2000). Additionally, this research relied on self-reported data from participants, raising the possibility of social desirability bias wherein women may have either under-reported autonomy, in presence of other household members conforming to the expected gender norms; or they could have over-reported autonomy to present themselves as more progressive to the interviewer.

Despite the aforementioned limitations, this study highlights important nuances in this area of research. The biggest strength of this study lies in its prospective nature, thereby allowing a temporal examination of autonomy's influence on contraception uptake. To the author's knowledge this is the first study of its kind to study autonomy in rural India as a dynamic construct with its relationship to contraception uptake. Moreover, while past research has often studied single dimensions of autonomy; this study applies a multidimensional construct capturing the independent relationships of each dimension with contraception use. Another strength of this study is the use of four diverse states as the backdrop of the research investigating the autonomy-contraception linkages. This setting increases the study's generalizability compared to past studies, which often focused on either one or two states; while underscoring the contextual influence of states on the studied pathways. Lastly, the study makes much-needed contributions to the sparse research literature available for Jharkhand in this area.

2. Recommendations

The findings from this study elicit recommendations for future research as well as policy and program implications. To enhance our understanding of women's autonomy in India and to build on the results from this study, the authors recommend the following as future research guidelines:

1. Qualitative research studies are needed to identify the intricacies of autonomy in different settings within India and consequently allow better contextualization of autonomy-scales for each state. These findings could solidify which autonomy dimensions (mobility, decision-making, financial or others) are more critical in specific settings; leading to appropriate weighting of items used in creating the autonomy indices. Confirmatory factor analysis can also be employed to further validate the items used in creating robust autonomy scales.

2. Future studies should consider measuring changes in community-level factors along with individual-level factors; given the importance of community context for contraception use. Changes can be measured for infrastructural factors such as number of primary health centers and community health workers and distance to a health facility. Additionally, aggregate levels of the Standard of Living Index indicating the proportion of households with medium or high standard of living, as used by Mistry et al (2009), can be included as community-level economic indicators.

3. Further studies are needed to explore the determinants of autonomy changes which lead to increased or decreased autonomy in different contexts. Longitudinal analysis exploring the associations between autonomy changes and different socioeconomic and reproductive health measures can reveal these linkages.

Identifying these determinants can highlight important areas for intervention to enhance women's autonomy in the respective settings.

In addition to research recommendations, the positive findings between increased financial autonomy and decision-making, with increased contraception use warrants specific policy/program considerations.

1. ***Promote community-based programs that build and enhance rural women's economic independence:*** With the recent success of microfinance models such as Grameen Foundation in rural South-Asia and its linkages to positive reproductive health behaviors (Schuler, et al., 1997); India's rural developmental policies should leverage such models that provide women with microloans along with mentorship for small-scale businesses. Evidence from extensive case studies of rural credit programs demonstrate that by strengthening a woman's economic role, there is a diffusion effect on other aspects of her autonomy including her freedom of movement, decision-making and a sense of economic security. Such efforts can promote economic autonomy among women from all socioeconomic statuses and educational levels; increasing their exposure beyond the household and reducing their dependence on their spouses' income.

2. ***Implement women's-support groups that address negotiation and decision-making skills:*** Leveraging the recently implemented platform of the ASHAs through the National Rural Health Mission (NRHM), women can be mobilized to convene in the form of women's groups. Through this forum, ASHAs can be trained in interpersonal negotiation skills that can be disseminated to their

respective community groups to increase women's self-efficacy regarding decision-making at the household and community level.

3. *Emphasis on adolescent girls' education:* Apart from the above specific recommendations, a note has to be made about continued emphasis on girls' education. As previously discussed, education is linked with increased exposure to the outside world, delays in age of marriage and increased employment opportunities; all mediating the path to contraception use (Jejeebhoy, 1995). While India's ratification of the Right to Education act in 2009, is a positive step in the right direction; targeted efforts are needed to ensure the translation of this act at the state and district level to increase girls' attendance and enrollment.

3. Conclusion

As one of the first studies to employ a prospective multidimensional measure of autonomy, the present study contributes to a better understanding of the temporal linkages between women's autonomy and contraception uptake in rural India. It elucidates that socio-demographic characteristics such as women's education, age, parity, religion, caste and number of sons are important predictors of contraception use in the rural context where sterilization continues to be the dominating method. The heavy dependence on a permanent contraceptive method challenges the ability to truly delineate the role of women's autonomy for using contraception to influence birth spacing and other reproductive health outcomes. Despite this, the study underscores the positive impact of increasing financial autonomy on contraception uptake even in the presence of other socioeconomic indicators; eliciting important policy and intervention implications. Strategies aimed at improving rural women's access to and control over finances as well

as savings-oriented financial support programs can contribute to improvements in women's reproductive health outcomes. Additionally, high decision-making in communities where aggregate education and employment levels for women are high can also contribute to significant increases in contraception uptake. Along with financial programs, this study stresses the importance of community-based interventions aimed at improving girls' and women's education and negotiation skills in the household and their potential impact on improving reproductive health in rural India.

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APPENDIX A: TABLES AND FIGURES

Figure 1: <u>A comparison of key sociodemographic indicators across Bihar, Jharkhand, Maharashtra and Tamil Nadu.</u>[4]

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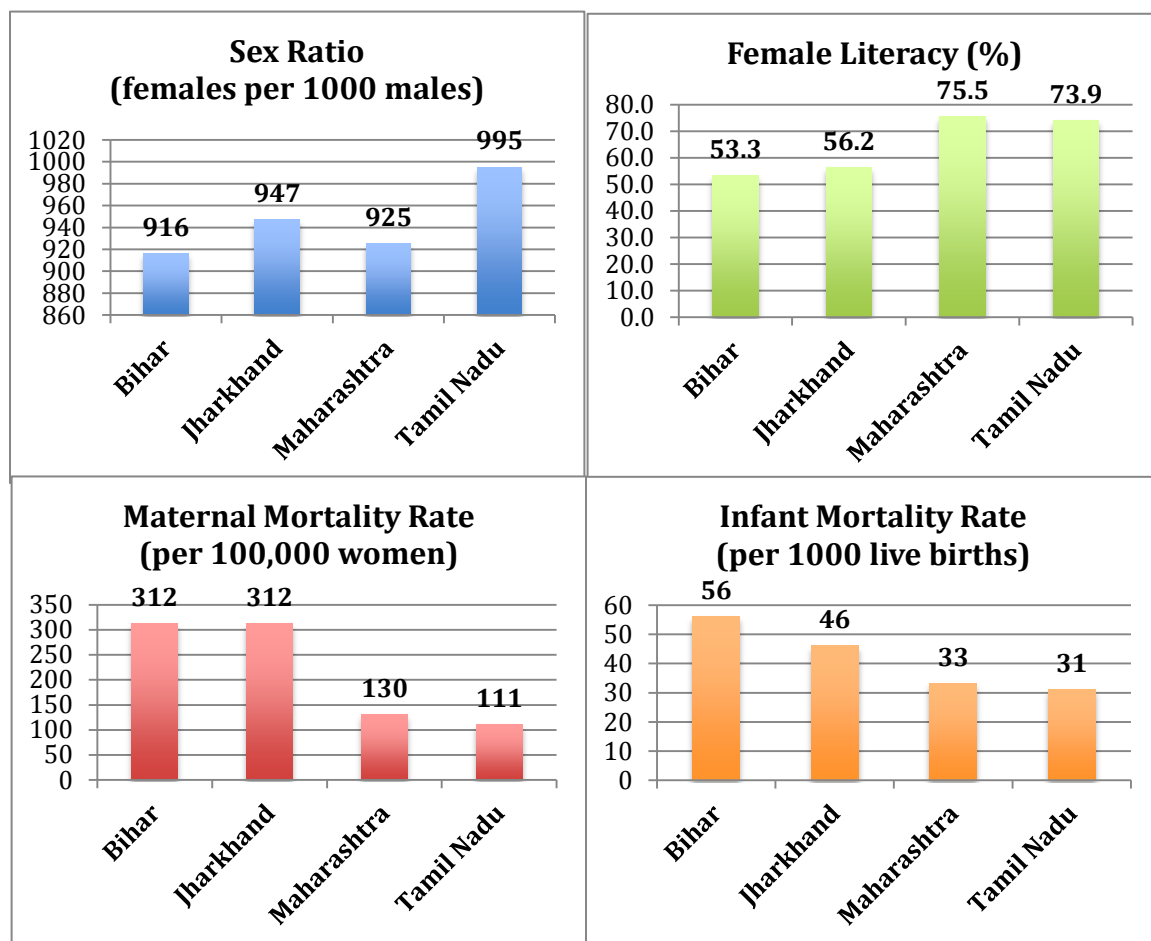
[4] Sex ratios and female literacy data were obtained from Census 2011 reports while maternal and infant mortality rates were obtained from the Sample Registration Systems, 2008.

Table 4: Summary of studies investigating the relationship between women's autonomy and contraception use in India.

Study Details	Study Objectives	Study Setting	Measures of Autonomy	Key Findings
Dharmalingam and Philip (1996) • Mixed Methods • N= 200	To examine associations between autonomy and contraception	Two villages in Rural Tamil Nadu	1. Perceived economic independence 2. Freedom of movement 3.Interspousal communication regarding family size and finances.	Autonomy was significantly associated with contraception. This association was stronger in the village with more socioeconomic opportunities for women.
Chacko, E. (2001) • Mixed Methods • N= 600	To examine the determinants of contraceptive use among married women in rural India	Rural West Bengal	N/A (explored qualitatively)	Qualitative results revealed autonomy themes as barriers to contraceptive use including lack of mobility and husbands' negative attitudes towards contraception-inhibiting women's decision-making.
Morgan, Stash, Smith and Mason (2002) • Survey of Status on Women and Fertility (SWAF) • Sample size not stated	To explore the relationship between autonomy and fertility patterns between Muslims and Non-Muslims	Multi-Country study including India (Uttar Pradesh and Tamil Nadu)	1. Decision-making 2. Freedom of movement 3. Emotional autonomy (domestic violence-related attitudes and experience)	Muslim women have higher parities, and a desire for more children than non-Muslim women; but this is not accounted for by lesser autonomy among Muslims. Individual-levels of autonomy were not significantly associated with fertility measures.
Moursund and Kravdal, (2003) • NFHS 1998-99 • N = 60,382	To analyze the role that autonomy plays in women's education-fertility relationship.	India	1. Decision-making 2. Physical autonomy 3. Economic autonomy 4. Included "emotional autonomy" as a community-level factor.	A woman's education does not influence her contraceptive use through a strengthening of her position in relation to that of men. Community-level factors relating to women's status such as mean educational levels are more important predictors than individual-autonomy for contraceptive uptake.

Jejeebhoy, S. (2002)	To explore inter-spousal differences in the perceptions of women's autonomy and its effect on reproductive health outcomes.	Uttar Pradesh (UP) and Tamil Nadu (TN)	1. Mobility Autonomy 2. Economic Autonomy 3. Decision-making autonomy	Contraceptive uptake was strongly associated with women's self-reported economic and mobility autonomy in TN rather than husband's perceptions. In contrast, husband's perceptions of their wives' autonomy were more influential for contraception use in UP.
• Community-based study of women's autonomy • N= 1,842 women 1,660 husbands				

Jejeebhoy, S. (2002)

Table 5: Sociodemographic characteristics of married rural women, aged 15-49 years in four Indian states (n=3610).

Variables	Bihar (n=1932) N (%)	Jharkhand (n=558) N (%)	Maharashtra (n=399) N (%)	Tamil Nadu (n=721) N (%)	Overall (n=3610) N (%)
Age in years					
<= 24	495 (25.6)	154 (27.6)	143 (35.8)	128 (17.8)	920 (25.5)
25-29	560 (29.0)	162 (29.0)	123 (30.8)	266 (36.9)	1111 (30.8)
30-34	455 (23.6)	137 (24.6)	71 (17.8)	175 (24.3)	838 (23.2)
35-39	281 (14.5)	75 (13.4)	38 (9.5)	95 (13.2)	489 (13.6)
40+	141 (7.3)	30 (5.4)	24 (6.0)	57 (7.9)	252 (7.0)
Education					
Illiterate	1556 (80.5)	453 (81.2)	215 (53.9)	399 (55.3)	2623 (72.7)
Literate	376 (19.5)	105 (18.8)	184 (46.1)	322 (44.7)	987 (27.3)
Employment Status					
Unemployed	938 (48.6)	147 (26.3)	74 (18.6)	288 (39.9)	1447 (40.1)
Employed	994 (51.5)	411 (73.7)	325 (81.5)	433 (60.1)	2163 (59.9)
Standard of Living					
Low	1181 (61.2)	382 (68.5)	206 (52.6)	318 (44.5)	2087 (58.1)
Medium	649 (33.6)	162 (29.0)	144 (36.7)	330 (46.2)	1285 (35.7)
High	101 (5.2)	14 (2.5)	42 (10.7)	66 (9.2)	223 (6.2)
Economic Conditions over past 4 years					
Same	924 (47.9)	301 (54.6)	228 (57.3)	273 (37.9)	1726 (48.0)
Better	508 (26.3)	178 (32.3)	125 (31.4)	127 (17.6)	938 (26.1)
Worse	497 (25.8)	72 (13.1)	45 (11.3)	321 (44.5)	935 (26.0)
Religion					
Hindu	1,585 (82.0)	451 (80.8)	365 (91.5)	675 (93.8)	3,076 (85.2)
Non-Hindu	347 (18.0)	107 (19.2)	34 (8.6)	45 (6.3)	533 (14.8)
Caste					
SC/ST	558 (28.9)	268 (48.0)	104 (26.1)	223 (30.9)	1,153 (31.9)
OBC	1,046 (54.1)	238 (42.7)	93 (23.4)	495 (68.7)	1,872 (51.9)
Other	328 (17.0)	52 (9.3)	201 (50.5)	3 (0.42)	584 (16.2)
Spousal Age [Mean (SD)]	5.3 (5.07)	5.40 (4.91)	5.09 (4.19)	5.30 (4.36)	5.31 (4.82)
Parity					
0-2 children	535 (27.7)	188 (33.7)	167 (41.9)	422 (58.5)	1,312 (36.3)
3-4 children	685 (35.9)	197 (35.3)	173 (43.4)	253 (35.1)	1,308 (36.2)
5+ children	712 (36.9)	173 (31.0)	59 (14.8)	46 (6.4)	990 (27.4)
Number of Sons					
0	309 (16.1)	109 (19.8)	92 (23.2)	216 (30.1)	726 (20.3)
1	624 (32.6)	203 (36.8)	181 (45.7)	302 (42.1)	1310 (36.6)
2	537 (28.1)	158 (28.7)	105 (26.5)	164 (22.9)	964 (26.9)
3	284 (14.8)	51 (9.3)	16 (4.1)	26 (3.6)	377 (10.6)
4 or more	160 (8.4)	30 (5.4)	2 (0.5)	9 (1.3)	201 (5.6)
Physical Violence					
Yes	355 (18.4)	142 (25.5)	54 (13.5)	197 (27.3)	748 (20.7)
No	1304 (67.5)	380 (68.1)	310 (77.7)	504 (69.9)	2948 (69.2)
Don't know	273 (14.1)	36 (6.5)	35 (8.8)	20 (2.8)	364 (10.1)

Table 6: Contraception uptake at follow-up and method type among contraception users across the four states, 2002-2003.

	Bihar (n=1932)	Jharkhand (n=558)	Maharashtra (n=399)	Tamil Nadu (n=721)	Overall (n=3610)
Contraception Uptake	357 (18.5)	106 (19.0)	230 (57.6)	298 (41.3)	991 (27.5)
Method Type					
Female Sterilization	223 (62.5)	66 (63.3)	185 (80.4)	262 (87.9)	736 (74.3)
Other Modern Method	71 (19.9)	16 (15.1)	28 (12.2)	18 (6.0)	133 (13.4)
Other Methods	63 (17.7)	24 (22.6)	17 (7.4)	18 (6.1)	122 (12.3)

Note: "Other Modern Method" includes oral contraceptive pills, condoms, IUD, injection and male sterilization. "Other Methods" include traditional methods such as periodic abstinence and withdrawal, among others.

Table 7: Frequency and percentage distribution of autonomy-related characteristics across the four states for baseline and follow-up period among married rural women, 1998-1999 and 2002-2003 [B: Baseline, F: Follow-up]

	Bihar (n=1932)		Jharkhand (n=558)		Maharashtra (n=399)		Tamil Nadu (n=721)		Overall (n=3610)	
	B	*F*	*B*	*F*	*B*	*F*	*B*	*F*	*B*	*F*
Financial Autonomy										
Allowed to set money aside	1,205 (62.4)	1,105 (57.3)	330 (59.1)	406 (72.8)	209 (52.4)	249 (62.9)	536 (74.4)	593 (82.3)	2,280 (63.2)	2,353 (65.3)
Decision-making Autonomy										
Involved in healthcare decisions	742 (38.4)	880 (45.6)	360 (64.5)	354 (63.4)	148 (37.1)	169 (42.4)	382 (53.1)	456 (63.3)	1632 (45.2)	1859 (51.5)
Involved in jewelry purchase decisions	608 (31.5)	867 (44.9)	347 (62.2)	389 (69.7)	170 (42.6)	161 (40.4)	460 (63.8)	502 (69.6)	1585 (43.9)	1919 (53.2)
Involved in visit decisions	646 (33.5)	892 (46.3)	341 (61.1)	391 (70.2)	124 (31.1)	159 (40.0)	416 (57.8)	370 (51.3)	1527 (42.3)	1812 (50.3)
Overall High Decision-making	881 (45.6)	1225 (63.6)	442 (79.2)	457 (82.1)	235 (58.9)	223 (56.0)	576 (80.1)	630 (87.4)	2134 (59.2)	2535 (70.4)
Mobility Autonomy										
For the Market										
Permission not needed	240 (12.4)	378 (19.6)	197 (35.3)	133 (23.8)	118 (29.6)	154 (38.6)	527 (73.1)	670 (92.9)	1082 (30.0)	1335 (37.0)
Permission needed	1,569 (81.3)	1,255 (65.0)	292 (52.3)	323 (58.0)	188 (47.1)	184 (46.1)	170 (23.6)	41 (5.7)	2219 (61.5)	1803 (50.0)
Not allowed to go	240 (12.4)	298 (15.4)	69 (12.4)	102 (18.3)	93 (23.2)	61 (15.3)	24 (3.3)	10 (1.4)	308 (8.5)	471 (13.0)
For Visiting People										
Permission not needed	233 (12.1)	1038 (53.8)	183 (32.8)	389 (69.7)	80 (20.1)	205 (51.4)	335 (46.5)	554 (76.8)	831 (23.0)	2186 (60.6)
Permission needed	1620 (83.9)	772 (40.0)	348 (62.4)	160 (28.7)	312 (78.2)	185 (46.4)	375 (52.0)	165 (22.9)	2655 (73.6)	1282 (35.5)
Not allowed to go	78 (4.0)	121 (6.3)	27 (4.8)	9 (1.60)	7 (1.8)	9 (2.3)	11 (1.5)	2 (0.3)	123 (3.4)	141 (3.9)
Overall High Mobility	251 (13.0)	965 (50.0)	213 (38.2)	341 (61.1)	123 (30.8)	199 (49.9)	529 (73.4)	683 (94.7)	1116 (30.9)	2118 (60.6)

Figure 3. Trends in autonomy demonstrated through percentage distribution of changes in each autonomy-dimension from baseline (1998-1999) to follow-up (2002-2003) for all four study states.
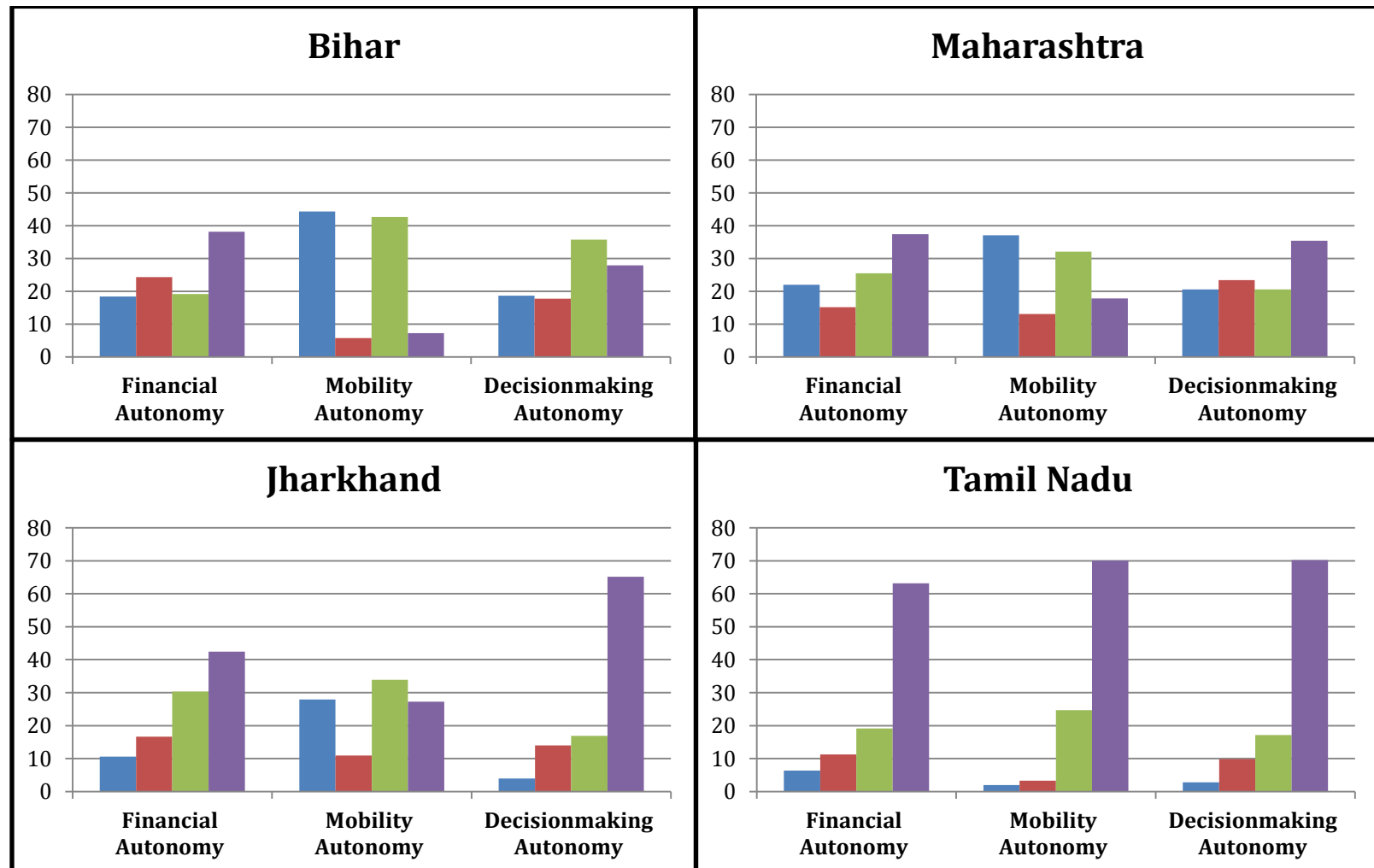
Legend:
- Low autonomy at both points
- Lost autonomy through inter-survey period
- Gained autonomy through inter-survey period
- High autonomy at both points

Table 8: Unadjusted odds ratios and 95% confidence intervals (CI) for associations between autonomy domains and contraceptive use among married rural women aged 15-49 in four states in India. [Significant associations at α = 0.05 are italicized and bolded]

Contraceptive Uptake (n=991)	
Explanatory Variables	**UOR (95% CI)**
Financial Autonomy (Reference: Low at both)	
Decreased	0.94 (0.72-1.23)
Increased	***1.58 (1.22-2.03)***
High at Both	***1.50 (1.19-1.88)***
Mobility Autonomy (Reference: Low at both)	
Decreased	1.32 (0.97-1.80)
Increased	***1.22 (1.02-1.46)***
High at Both	***1.75 (1.44-2.12)***
Decision-making autonomy (Reference: Low at Both)	
Decreased	1.15 (0.87-1.51)
Increased	1.04 (0.81-1.35)
High at Both	***1.39 (1.01-1.76)***
Age (Reference: < = 24 years)	
25-29	***2.00 (1.64- 2.44)***
30-34	***1.58 (1.27-1.95)***
35-39	1.06 (0.82-1.38)
40+	***0.53 (0.35-0.79)***
Spousal Age Difference	***0.98(0.97-0.99)***
Educational Level (Reference: Illiterate)	
Literate	***2.99 (2.55-3.49)***
Caste (Reference: Scheduled Class/ Tribe)	
Other Backward Class	***1.28 (1.08-1.52)***
Other	***2.10 (1.70-2.62)***
Religion (Reference: Non-Hindu)	
Hindu	***2.16 (1.70-2.76)***
Standard of Living (Reference: Low)	
Medium	***1.66 (1.42-1.94)***
High	***3.42 (2.58-4.54)***
Parity (Reference: 0-2 Children)	
3-4 children	***2.16 (1.81-2.56)***
> 5 children	1.04 (0.86-1.28)
Number of Sons (Reference: None)	
1 son	***3.44 (2.65- 4.46)***
2 sons	***5.30 (4.06- 6.91)***
3 sons	***3.04 (2.19-4.20)***
4 or more sons	***1.70 (1.11-2.62)***
State (Reference: Bihar)	
Jharkhand	1.03 (0.81-1.32)
Maharashtra	***6.00 (4.77-7.55)***
Tamil Nadu	***3.11 (2.58-3.75)***
Physical Violence (PV) (Reference: No experience of PV)	
Experienced PV	***0.78 (0.65-0.95)***
Missing/Unknown PV data	***0.65 (0.50- 0.85)***

Table 9: <u>Odds Ratios with 95% CI from logistic regression models of contraceptive uptake, adjusted for socioeconomic covariates among married rural Indian women aged 15-49 from four states. [Significant associations at α = 0.05 are italicized and bolded]</u>

Explanatory Variables	Odds Ratio (95% CI)
Financial Autonomy (Reference: Low at both)	
Decreased	1.03 (0.75-1.41)
Increased	***1.55 (1.15-2.09)***
High at Both	1.26 (0.96-1.67)
Mobility Autonomy (Reference: Low at both)	
Decreased	0.98 (0.68-1.43)
Increased	1.07 (0.86-1.35)
High at Both	0.98 (0.72-1.31)
Decision-making autonomy (Reference: Low at Both)	
Decreased	1.07 (0.77-1.49)
Increased	1.16 (0.86-1.58)
High at Both	1.21 (0.90-1.63)
Age (Reference: < = 24 years)	
25-29	***1.53 (1.20-1.97)***
30-34	***1.24 (0.94-1.65)***
35-39	0.79 (0.57-1.11)
40+	***0.34 (0.21-0.56)***
Spousal Age Difference	
	0.98 (0.96-1.00)
Educational Level (Reference: Illiterate)	
Literate	***2.12 (1.71-2.61)***
Caste (Reference: Scheduled Class/ Tribe)	
Other Backward Class	1.18 (0.96-1.45)
Other	***1.44 (1.07-1.93)***
Religion (Reference: Non-Hindus)	
Hindu	***2.17 (1.63-2.88)***
Standard of Living (Reference: Low)	
Medium	***1.36 (1.11-1.65)***
High	***2.26 (1.57-3.27)***
Parity (Reference: 0-2 children)	
3-4 children	***2.37 (1.88-2.98)***
> 5 children	***2.19 (1.60-3.00)***
State (Reference: Bihar)	
Jharkhand	1.14 (0.87-1.51)
Maharashtra	***7.86 (5.83-10.59)***
Tamil Nadu	***4.30 (3.21 -5.76)***
Number of Sons (Reference: None)	
1 son	***4.38 (3.25-5.91)***
2 sons	***8.32 (6.04-11.5)***
3 sons	***6.78 (4.53-10.3)***
4 or more sons	***5.46 (3.26-9.15)***
Physical Violence (PV) (Reference: No experience of PV)	
Experienced PV	0.86 (0.69-1.08)
Missing/Unknown PV data	0.87 (0.64-1.18)

Table 10: <u>Odds Ratios and 95% CIs from multivariate analysis of factors associated with contraceptive uptake adjusted for age, spousal age-difference, parity, education, standard of living, caste, religion, number of sons and experience of physical violence, for each state.</u>

Explanatory Variables	Bihar	Jharkhand	Maharashtra	Tamil Nadu
Financial Autonomy (Reference: Low at Both)				
Decreased	1.22 (0.80-1.86)	1.25 (0.43-3.65)	0.41 (0.17-1.03)	0.65 (0.27-1.59)
Increased	1.40 (0.90-2.18)	2.17 (0.82-5.77)	1.08 (0.47-2.47)	1.58 (0.71-3.53)
High at Both	1.34 (0.90-2.00)	1.19 (0.46-3.07)	0.96 (0.43-2.16)	1.23 (0.59-2.57)
Mobility Autonomy (Reference: Low at Both)				
Decreased	0.77 (0.43-1.40)	*2.93 (1.11 -7.70)*	0.80 (0.31-2.06)	2.98 (0.48-18.6)
Increased	1.12 (0.84-1.50)	1.66 (0.80-3.43)	0.49 (0.24-0.97)	3.45 (0.70-17.1)
High at Both	0.64 (0.36-1.14)	1.44 (0.64-3.25)	0.67 (0.28-1.59)	3.24 (0.66-15.8)
Decision-making Autonomy (Reference: Low at Both)				
Decreased	0.93 (0.60-1.44)	0.82 (0.17-4.03)	1.16 (0.52-2.57)	3.00 (0.90-10.0)
Increased	1.05 (0.72-1.53)	2.78 (0.63-12.36)	1.82 (0.76-4.31)	1.30 (0.41-4.15)
High at Both	1.05 (0.72-1.53)	1.75 (0.42-7.32)	*2.67 (1.19-6.00)*	1.96 (0.66-5.84)
Other Covariates				
Age (Reference: <- 24 years)				
25-29	1.50 (0.99 -2.26)	*3.51 (1.57-7.81)*	*2.71 (1.29-5.69)*	1.14 (0.69-1.86)
30-34	*1.81 (1.16-2.82)*	*3.58 (1.46-8.80)*	1.07 (0.44-2.59)	*0.51 (0.30-0.89)*
35-39	*1.52 (0.91 -2.53)*	1.34 (0.45-4.01)	0.69 (0.24-1.98)	*0.22 (0.11-0.44)*
40+	0.66 (0.32-1.36)	2.25 (0.59-8.52)	*0.17 (0.04-0.68)*	*0.06 (0.02-0.18)*
Spousal Age Difference				
	1.00 (0.97-1.03)	*0.93 (0.87-0.99)*	0.95 (0.90-1.02)	0.97 (0.93-1.01)
Education (Reference: Illiterate)				
Literate	*2.29 (1.65-3.16)*	*3.89 (1.94-7.81)*	*1.98 (1.00 -3.92)*	*1.76 (1.18-2.64)*
Caste (Reference: Scheduled Caste/ Tribe)				
Other Backward Class	1.13 (0.83 -1.55)	*2.13 (1.19-3.82)*	1.47 (0.65-3.30)	1.09 (0.73-1.63)
Other	1.51 (0.96-2.37)	2.00 (0.79-5.06)	1.13 (0.57-2.24)	0.92 (0.07-12.0)
Religion (Reference: Non-Hindu)				
Hindu	*3.55 (2.26-5.57)*	*2.38 (1.13-5.04)*	*0.27 (0.08-0.92)*	1.38 (0.64-3.01)
Standard of Living (Reference: Low)				
Medium	*1.44 (1.07-1.95)*	1.33 (0.73-2.41)	*2.66 (1.29 -5.47)*	1.26 (0.85-1.87)
High	*4.18 (2.41-7.26)*	3.17 (0.66-15.17)	0.70 (0.26-1.85)	*2.51 (1.26-5.03)*
Parity (Reference: 0-2 Children)				
3-4 children	*2.18 (1.44-3.32)*	1.07 (0.51 -2.28)	*2.25 (1.16 -4.40)*	*4.11 (2.71-6.22)*
> 5 children	*1.93 (1.18-3.17)*	1.31 (0.53 -3.22)	1.19 (0.45 -3.16)	*3.30 (1.38-7.89)*
Number of Sons (Reference: None)				
1 son	*3.81 (1.98-7.33)*	*5.09 (1.56-16.56)*	*26.4 (11.5-60.6)*	*2.79 (1.81-4.31)*
2 sons	*7.72 (3.99-14.95)*	*21.84 (2.22-37.65)*	*41.75 (16.1-108.2)*	*4.21 (2.54-6.95)*
3 sons	*5.97 (2.92-12.20)*	*9.15 (2.22-37.65)*	*19.94 (4.28-92.8)*	*4.37 (1.50-12.7)*
4 or more sons	*5.19 (2.32-11.62)*	*7.58 (1.58-36.45)*	*-*	2.06 (0.38-11.1)
Physical Violence (PV) (Reference: No experience of PV)				
Experienced PV	*0.50 (0.34-0.75)*	1.21 (0.67-2.20)	0.69 (0.31- 1.53)	1.50 (1.00-2.27)
Missing PV data	0.85 (0.59-1.23)	0.59 (0.20-1.76)	0.99 (0.37-2.65)	0.71 (0.21-2.44)