Ashoka University Economics
Discussion Paper 73

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December 2021

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Widowhood and Consumption of Private Assignable Goods: The Role of Socio-Economic Status, Rainfall Shocks and Historical Institutions *

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December 2021

Abstract

We study how weather shocks interact with cultural norms biased against women to affect female poverty within the household. Using expenditure on female assignable clothing per adult woman as a measure of women's intra-household access to consumption, we document that spending on female assignable goods is lower in households with at least one widowed woman relative to households with no widows in India. However, selection into widowhood appears to be plausibly random and economic hardship on account of death of a male member is unlikely to explain why households with a widow have lower spending on female assignable goods. We then study how rainfall shocks influence the spending on female assignable goods by the presence of a widow in the household. We find that although beneficial rainfall shocks increase overall spending on female assignable goods; this increase is lower in households with a widow. We obtain opposite findings for spending on male assignable goods. We find that regions where widow persecution was widespread historically are associated with poorer outcomes for widows at present. Our analysis shows that persistence in historical norms can potentially prevent women from realizing gains in access to consumption resources within the household even in the event of beneficial environmental shocks.

Keywords: widows; rainfall shocks; private assignable goods; historical persistence; India
JEL Codes: D13; I31; J12; J16; N35; Q54; Z10

*We are grateful to Ashoka University for financial support through an Economics Department research grant and thank Sumedha Shukla for research assistance. All errors are our own.

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1 Introduction

It is widely known that widows are marginalized in Indian society. Chen and Dreze (1995), Mohindra et al. (2012) mention that the experience of losing one's spouse is remarkably different for men and women in India. They note that widows, unlike widowers, face significant restrictions on mobility, remarriage and have limited access to property rights and employment [1]. Further, Chen (2000), Jensen (2005) and Czerenda (2010) mention that, in particular, Hindu widows avoid social events and are usually mandated to change their dress and diet. According to the Census of India, 2011 women outnumber men among widowed individuals among all age groups. In particular, among individuals aged 60 years and above, there are more than thrice as many widowed women as there are widowed men. Large age gap between spouses and greater prevalence of remarriage among widowers are plausible reasons why women outnumber men among the widowed population (Jensen, 2005). Therefore, it is of considerable interest to study the well-being of widows [2]. In this context, we first document whether the presence of a widow affects women's and men's consumption levels within the household differently and explore the heterogeneity by caste, religion and affluence of the households. Given the importance of environmental shocks in determining household welfare in an economy that depends largely on rain-fed agriculture, it is important to explore whether temporal environmental shocks such as rainfall shocks affect women's consumption within the household differently when a widow is present relative to when a household has no widows. Lastly, we investigate the role of potential persistence in historical cultural norms regarding the treatment of widows in explaining our findings.

A number of studies have examined gender bias in resource allocation within the household. While there exists a number of studies on gender bias in resource allocation for children [3], studies by Bhalotra and Attfield (1998), Calvi (2020), Brown et al. (2018) have shown that resource shares are lower and individual level poverty rates are higher for adult women than for men. Interestingly although Bhalotra and Attfield (1998) do not find differential treatment of the elderly in rural Pakistan, Maharana and Ladusingh (2014) find that expenditures on health and food are lower for older women in a number of South Asian countries and Calvi (2020) finds that women's bargaining power and resource shares within the household declines with age in India. Although these studies have investigated gender differences in

[1] Widowhood for women is found to negatively influence women's access to property (Chapoto et al., 2011) and overall material well-being and economic status in the context of both high and low income countries (Cherchye et al. (2012), Hurd and Wise (1989), Rahman et al. (1992)).

[2] Throughout this paper, by widowed members/widowed individuals/widow, we will be referring to women whose spouses have died and who have not remarried.

[3] For example, see the studies by Deaton (1989) Lancaster et al. (2008), Zimmermann (2012), Aslam and Kingdon (2008), Wongmonta and Glewwe (2017).

intra-household resource allocation, relatively fewer studies have specifically focused on how widowhood might influence such within-household resource allocation across genders.

Chen and Drèze (1992), Chen and Dreze (1995) have documented that widows often face poorer health condition, higher mortality risk and significant barriers in accessing the labour market. Cherchye et al. (2012) finds that the decline in material well-being is substantial when women are widowed. Van de Walle (2013) shows that widowhood has a long lasting negative effect on living standards of ever-widowed women in Mali. Lloyd-Sherlock et al. (2015) find that being widowed is correlated with belonging to the poorest wealth quintiles in a number of countries. Further, among female headed households, those headed by widows are found to be poorer in a large number of African countries (Brown and van de Walle (2020), Appleton (1996), Horrell and Krishnan (2007)). Calvi (2020) finds that resource share for women is lower in households with a widow while examining how bargaining power of women declines with age. Widowhood has also been documented to result in loss of access to one's husband's assets and could influence women's fertility behaviour and health (Chapoto et al., 2011; Hurd and Wise, 1989; Lambert and Rossi, 2016). These studies, therefore, motivate us to examine the role of widowhood for women in influencing women's and men's access to consumption within the household.

In this paper, at first, we document how the presence of a widow in the household affects household consumption expenditure on female assignable goods in India. The reason for studying India in this context is primarily motivated by Anderson and Ray (2019) who find that India accounts for the largest share of women who are missing on account of not having a husband [4]. Now, Van de Walle (2013) finds that among female headed households, households headed by widows are particularly poorer; however, the study relies on overall household level income or consumption for the analysis. A natural extension of such an analysis would be to investigate how consumption of specific goods by women is affected by the presence of at least a widow in the household, which is what we attempt to study in this paper. We consider the expenditure on adult woman's clothing per adult female as the indicator of household spending on female assignable goods [5] [6]. We rely on multiple rounds of large, nationally representative data on consumption expenditure called the National

[4]In the context of India, the state of being unmarried for adult women largely implies being widows as marriage is nearly universal and divorce is relatively rare.

[5]Throughout this paper we will use the term female (male) assignable goods to imply spending on adult women's (men's) clothing per adult female (male).

[6]Individual level data on consumption of all goods is rarely available. Expenditure data on clothing for different household members have been used to identify resource share and estimate individual level poverty rate in Browning et al. (1994), Dunbar et al. (2013), Lechene et al. (2020), Calvi (2020). Detailed data on individual level food consumption in Bangladesh has been used in Brown et al. (2018).

Sample Surveys (NSS) that cover a time period of nearly two decades for our analysis [7]. The NSS contains information on asset, overall expenditure level as well as a number of demographic characteristics of the households including household caste, religion, location of residence; age, gender, marital status and educational attainment of household members. After controlling for a number of these factors that could potentially influence expenditure on assignable goods, we find that households that have a widow have lower spending on female assignable goods relative to households that have no widows.

An important concern that may arise is that since we are comparing women's access to consumption between households with and without any widows, any potential difference between these two households could be driven due to differences between currently widowed and married women that are distinct from widowhood. Households where widows are found could be more disadvantaged to start with relative to those that have only married women. In other words, selection into widowhood may be non-random as women who are currently widowed may have been married to men with relatively higher mortality risk (due to plausibly pre-existing economic disadvantages etc.). This concern may be important as we do not have panel data that tracks households and individuals over time when the latter transition from being married to widowed. We address this concern in the following way. The concern that selection into widowhood may be non-random reduces for older individuals. Widows, in general, are likely to be older women and as husbands are typically older than wives in most marital unions in India, widowhood becomes more common as couples age. Therefore, we try to address this concern for younger women for whom widowhood may be relatively uncommon. In the absence of panel data that tracks an individual over their marital trajectories, we seek to compare human capital endowments or childhood circumstances that are largely determined before marriage, but may influence matching in the marriage market, across currently widowed and married women aged 19-49 years from an alternative, but nationally representative data [8]. These outcomes include height that captures childhood level of nutrition and plausibly overall childhood economic condition, childhood place of residence as individuals residing in rural area may have limited access to amenities and public goods for health and education relative to their counterparts in urban areas, and education level. We find that even among 19-49 year old women, widowed women are significantly older than than their married counterparts and the age gap is large as well. We, therefore, examine

[7] The NSS consumption expenditure data provide detailed information on consumption on a large number of items. However, most of the information on consumption expenditure is at the household level. Clothing expenditure data are provided by gender of the household members, which is what we use as information on assignable good consumption for our analysis.

[8] We use the Demographic and Health Surveys (DHS) for this purpose, as the NSS does not provide us with this information.

the differences across height, childhood place of residence and educational attainment by five year age cohorts of currently widowed and married women. We find that either there is no significant or very negligible (weakly significant) difference in height and no significant difference in childhood place of residence being a rural area between currently widowed and married women. Although educational attainment of currently married women are found to be higher than their currently widowed counterparts, this is unlikely to be a concern as we control for educational attainment of household members in our regressions as this can directly influence the spending on private assignable goods. Therefore, we have some suggestive evidence that even for younger women aged 19-49 years, selection into widowhood is unlikely to be non-random.

Another concern that may arise is that the lower spending on female assignable goods in households with a widow is likely on account of lower overall expenditure and not due to plausible bias against widowed women. Therefore, we also examine the effect of a presence of a widow on expenditure on male assignable goods. We find that either there is no significant difference or somewhat higher spending on male assignable goods in households with at least a widow relative to those where no widows are present. Further, we also assess the difference in spending on female assignable goods between households with and without widows by the overall income category to which the household belongs, in order to understand whether households with widows that belong to the lower tail of the income distribution are also likely to have the lowest expenditure on female assignable goods. However, we find that the gap in spending on female assignable goods between households without and with a widow is the largest for households that belong to the middle and top 30% of the income distribution. Therefore, women in households with a widow appear to have the lowest access to consumption resources within the household among relatively richer households; which further indicates that overall household poverty cannot explain why consumption spending on female assignable goods is lower in households with a widow. The finding that spending on male assignable goods is relatively higher in households with a widow may also be suggestive of greater within-household discrimination against women on account of the presence of a widow as widows are unable to decrease men's expenditure by as much as their married counterparts, in the spirit of Deaton (1989) who studies a similar issue on within-household gender bias for children. While our measure of female assignable goods assumes that all adult women within the same household have equal share of adult female clothing [9], it is important to note that our results show that presence of at least one widow lowers the per

[9]It is possible that even within the same household, widowed women have lower access to consumption goods relative to their married counterparts; however we are not able to capture this with our existing data on assignable goods.

capita share of adult women's clothing expenditure for all women in the household relative to a household where there are no widows. This suggests that the presence of a widow is the likely reason for lower per adult woman spending on female clothing.

Another important concern is that widowhood is correlated with older age and women's bargaining power within the household has been shown to decline with age (Calvi, 2020). Therefore, one might argue that our findings could be explained by the presence of older women, irrespective of their marital status. To address this concern, we control for the presence of women aged 60 years or older within the household and find that presence of widows continues to have significant negative effect on spending on female assignable clothing [10]. Further, households with younger widows appear just as disadvantaged as households with older widows in terms of consumption of female assignable goods. Therefore, widowhood appears to have a negative effect on the consumption of female assignable goods that is distinct from the effect of older age. In this context, our findings are similar to Van de Walle (2013) who finds that widow headed households are poorer irrespective of the age of the widows in Mali. Lastly, we explore a number of differences in terms of consumption of female assignable goods between households that have a widow and those that do not by household caste, and religion. A number of studies in the literature have shown that the well-being of widows can often differ on account of their caste and religion due to different social norms prevalent among different groups (Jensen, 2005; Milazzo and Walle, 2019). We find that the decline in the spending on female assignable goods in households that have a widow is higher among upper castes and Hindus. As upper castes and Hindus in general are more likely to impose restrictions and mandate stricter compliance with rituals surrounding widowhood, this could be a likely explanation for our finding regarding these households. These findings indicate that households with a widow that are also relatively in an advantageous position in terms of their socio-economic status in Indian society are likely to have the lowest spending on female assignable goods. This finding is also consistent with our earlier finding that spending on female assignable goods is lowest in households with a widow that are also the richest.

After documenting that women's access to consumption resources within the household is significantly lower on account of the presence of a widow and that it is unlikely to be driven by pre-existing differences between households unrelated to widowhood, we study how plausibly exogenous environmental shocks may differently impact female poverty within the household between these types of households. There are two reasons why we are motivated to perform this analysis. Firstly, environmental shocks such as rainfall shocks play

[10] We define elderly women as women aged 60 years or older following the definition of elderly women in Bhalotra and Attfield (1998).

an important role in influencing overall household welfare in an economy that is largely dependent on rain-fed agriculture. Therefore, it might be interesting to examine how rainfall shocks can specifically influence women's and men's consumption in the household in the presence of widows. Secondly, as rainfall variability has become more frequent over time on account of climate change, our analysis can provide important insights in understanding how environmental shocks can differently impact women and men on account of cultural norms. We pool together multiple rounds of the NSS consumption expenditure data and combine it with gridded monthly rainfall data for our analysis. We compute alternative measures of district specific rainfall shocks by considering monthly rainfall data of over four decades. Since we consider consumption expenditure data from multiple years, we deflate our expenditure figures using alternative measures of the consumer price index relevant for rural areas and use real expenditure in our analysis. We find that positive rainfall shocks increase the spending on female assignable goods in the household. However, households with a widow continue to have lower expenditure on female assignable goods relative to households without any widows, even in the event of beneficial rainfall shocks. In other words, relative to negative rainfall shocks, positive rainfall shocks improve spending on female assignable goods by a greater extent in households without any widows when compared to households with at least one widow. We also investigate whether there exists any impact of rainfall shocks on the spending on male assignable goods depending on whether at least a widow is present in the household. Indeed we find that, positive rainfall shocks raise the spending on male assignable goods overall; but increase the spending on male assignable goods more in households with at least one widow relative to those where no widows are present. Therefore, we find opposite implications of rainfall shocks on spending on female and male assignable goods in the household by presence of widows. Our results are robust to including a rich set of controls, district and year fixed effects as well as alternative measures of rainfall shocks.

Our finding that although beneficial environmental shocks raise the overall spending on female assignable goods; but that this increase is lower for households with widows motivates us to understand any potential mechanism that could explain this result. We explore whether customs resulting in persecution of widows in the past can potentially explain why access to consumption within the household is likely to be lower for women and spending on female assignable goods does not increase by as much when a widow is present in the household even in the event of beneficial shocks to household consumption expenditure. We specifically focus on the historical custom of *Sati* which involved the burning alive of a recently widowed woman on her husband's funeral pyre among Hindus. Widow burnings were particularly prevalent in the eastern districts of the erstwhile Bengal Presidency during the colonial rule before being outlawed in 1828. Sekhri (2019) describes that Bengal diverged from laws

governing inheritance, following the *Dayabhaga* instead of the *Mitakshara* school of law. This was on account of a different interpretation of religious texts and laws by an eminent jurist, *Jimutavahana*, who served in the court of the *Sena* king *Vijaysena* in the 12th century. Unlike the *Mitakshara* school, widows had the right to inherit their deceased husband's property in the absence of male heirs in the *Dayabhaga* school. Sekhri (2019) suggests that the ability of widows to inherit their deceased husband's property may have provided incentives to her husband's other male relatives to kill the widow so that they could inherit his property instead. This can potentially explain why widow burnings were more common in the eastern districts of the Bengal Presidency as these regions followed the *Dayabhaga* school of law and were historically a part of the *Sena* kingdom (Sekhri, 2019). We therefore, study whether spending on female assignable goods is indeed lower in households with a widow for households that are located in regions that were historically associated with extremely high prevalence of widow burnings during the colonial rule.

Comparing across neighbouring districts that differed in terms of historic prevalence of widow burnings, but which are likely to be largely culturally similar otherwise, we find that spending on female assignable clothing is indeed lower in households with a widow and this is particularly pronounced for households that currently lie in regions that correspond to extremely high prevalence of widow burnings in the past. Importantly, we further confirm that it is households in the historically *Dayabhaga* following regions in Bengal and alternatively historically governed by the *Senas* (and therefore, associated with high prevalence of widow burnings in the past) for which we see that the gap in spending on female assignable goods between households without and with a widow is the largest, with the latter associated with a lower spending on female assignable goods. We compare these districts with their neighbouring districts that followed the *Mitakshara* school and alternatively fell beyond the territorial limits of the historic *Sena* kingdom. Interestingly, regions that followed the *Dayabhaga* school and were governed by the *Senas* in the past have higher overall spending on female assignable goods, relative to their neighbouring districts that historically followed the alternative legal school, *Mitakshara* and were beyond the jurisdiction of the *Senas* [11]. Therefore, it is only households with widows in these regions that have lower spending on female assignable goods at present. Further, we obtain opposite findings for spending on male assignable goods in this context. Our findings remain robust to using alternative geographic limits of *Dayabhaga* following or *Sena* governed regions as well as their neighbouring districts. Therefore, persistence of the cultural norm of mistreating widows can be a potential reason why women's access to consumption resources within the household continues

[11] This is consistent with Sekhri (2019), who shows that after *Sati* was outlawed, these regions witnessed better outcomes for women in the long run on account of favourable inheritance rights.

to be lower in households with a widow and may prevent women from realizing the gain in consumption within the household even in the event of beneficial environmental shocks.

Our paper contributes to the existing literature in several ways. Firstly, it attempts to add to the literature on intra-household gender bias in consumption by examining how widowhood for women impacts women's and men's access to consumption within the household. Secondly, we show that poverty cannot potentially explain why households with a widow have lower spending on female assignable goods and households that belong to relatively more advantageous socio-economic groups are likely to have the lowest expenditure on female assignable goods, conditional on the presence of at least a widow. Further, the existing literature has shown that women's bargaining power within the household declines with age. While we do not dispute that older age adversely affects women's access to consumption within the household, we show that widowhood is an additional source of disadvantage for women that is distinct from the effect of older age. Thirdly, we use plausibly exogenous variation in rainfall over a long period of time and show that the increase in real consumption spending on female assignable goods is lower in households that have at least one widow relative to households which have no widowed women in the event of positive rainfall shocks; despite positive rainfall shocks increasing spending on female assignable goods in general. We study the role of historical institutions that were associated with persecution of widows in the past to understand whether persistence in historical cultural norms about the treatment of widows can potentially explain our results. We, therefore, attempt to contribute to the literatures of environmental economics and economic history/cultural economics by showing how plausible persistence in cultural norms may prevent women from accessing gains in consumption resources within the household even in the event of beneficial environmental shocks.

This paper is organized as follows. Section 2 describes the data; Section 3 contains the empirical specifications used for descriptive analysis, addresses issues concerning selection into widowhood and presents the initial descriptive results; Section 4 presents the analysis on rainfall shocks and its implications for households with a widow; Section 5 describes potential mechanisms for explaining our results by studying the role of historical institutions governing the treatment of widows; Section 6 concludes.

2 Data

2.1 Data on Consumption and Socio-Economic Demographic Variables

We use five rounds of nationally representative consumption expenditure data from the National Sample Surveys (NSS) for the purpose of our analysis. The NSS are repeated cross-sectional data. We use five thick rounds corresponding to 1993-1994 (50th round), 1999-2000 (55th round), 2004-2005 (61st round), 2009-2010 (66th round) and 2011-2012 (68th round) for our study. The NSS consumption expenditure data contains detailed information on consumption spending on a large variety of food and non-food items. As almost all data on consumption spending are at the household level as opposed to the household member level, we use information on spending on women's (and men's) clothing as indicators of consumption of private assignable goods. In particular, we use information on the value of expenditure incurred during the last 365 days on clothing and convert them to monthly expenditure figures. With the exception of the 68th round, we include *saree* as women's clothing. The 68th round includes additional items that can be classified as women's clothing, namely *kurta pajama suits* for females [12]. We define individuals as adults if they are 15 years of age or older. We convert the monthly expenditure on clothing for women to per capita figures by dividing the expenditure items by the number of adult females in the household. Therefore, our outcome variable of interest shows the monthly expenditure on female clothing per adult female. We present the summary statistics on our outcome variable in Table 1. We find that, on an average across all households, spending on female assignable goods is lower in households with a widow relative to those that have no widows. We find that the average expenditure on female assignable goods ranges between Rs. 16 and Rs. 48 for households with at least one widow member during 1993-94 to 2011-12 from Table 1. However, the corresponding average ranges between Rs. 20 and Rs. 64 for a household without any widows during the same time period.

The NSS provides data on a number of household characteristics. We present the summary statistics of these household level socio-economic and demographic characteristics in Table 2. We find that the fraction of households with at least one widow ranges from 16% to 17% across the various survey rounds. Around 60% of the households are found to belong to rural areas. The proportion of non-SC/ST/OBC households ranges between 34% to 41% across various NSS survey rounds, with the exception of the 1993-94 round which did not collect any information on OBCs. Therefore, for the 1993-94 round, the fraction

[12] We also consider men's clothing as indicators of male assignable good consumption as an outcome variable. We consider *dhoti* and *lungi* as men's clothing. For the 68th round, we also include *kurta pajama suits* for males as an additional item of men's clothing.

Table 1: Summary Statistics: Monthly Expenditure on Female Assignable Goods

Variable	Mean	SD	Observations
Panel A: Households with a widow member			
Per Adult Female Spending on Women's Clothing:			
1993-1994	16	19	19,867
1999-2000	20	22	20,099
2004-2005	22	24	21,507
2009-2010	30	33	16,344
2011-2012	48	56	16,770
Panel B: Households without a widow member			
Per Adult Female Spending on Women's Clothing:			
1993-1994	20	26	88,052
1999-2000	25	30	92,736
2004-2005	28	31	96,868
2009-2010	38	51	79,583
2011-2012	64	76	79,941

Note: Data source is various rounds of NSS. Weighted means are reported."SD" refers to standard deviation. Observations are at the household level. Figures refer to monthly expenditure and rounded to the nearest rupee. Adult refers to an individual aged 15 years or older. For the 2011-12 round, women's clothing includes saree, similar to previous rounds and in addition includes kurta-pajama suits for women.

Table 2: Summary Statistics: Socio-Economic and Demographic Characteristics of the Households

Year:	1993-94	1999-00	2004-05	2009-10	2011-12
Variable: Mean (SD)					
HH has widow	0.17 (0.38)	0.17 (0.37)	0.17 (0.38)	0.16 (0.37)	0.16 (0.37)
Rural	0.60 (0.49)	0.59 (0.49)	0.64 (0.48)	0.59 (0.49)	0.59 (0.49)
Non-SC/ST/OBC*	0.72 (0.45)	0.41 (0.49)	0.34 (0.47)	0.33 (0.47)	0.32 (0.47)
Hindu	0.79 (0.40)	0.78 (0.42)	0.76 (0.42)	0.76 (0.43)	0.76 (0.43)
HH Size	4.89 (2.55)	4.99 (2.65)	4.89 (2.52)	4.64 (2.34)	4.57 (2.25)
MPCE (Rs.)	432.16 (582.58)	759.28 (1058.08)	851.50 (1160.50)	1493.74 (2711.42)	2050.87 (4206.04)
HH Average Age (yrs.)	27.61 (11.50)	28.16 (11.63)	29.02 (11.98)	30.23 (12.08)	30.73 (12.05)
No. Male Children	0.90 (1.04)	0.95 (1.08)	0.89 (1.02)	0.77 (0.93)	0.74 (0.90)
No. Female Children	0.80 (1.03)	0.85 (1.06)	0.80 (1.03)	0.68 (0.94)	0.64 (0.90)
No. of Educated Adults	0.72 (1.18)	0.88 (1.33)	0.27 (0.69)	1.22 (1.42)	1.31 (1.44)
Widow HH Head	0.06 (0.24)	0.06 (0.24)	0.07 (0.26)	0.08 (0.26)	0.08 (0.27)
Total Land Possessed (hectares)	0.09 (0.31)	0.84 (2.59)	0.95 (38.64)	0.64 (1.85)	0.59 (1.72)
HH has Women above 60 yrs.	0.16 (0.36)	0.17 (0.38)	0.17 (0.38)	0.18 (0.38)	0.19 (0.39)
Observations	115,354	120,309	124,644	100,855	101,662

Note: Data source is various rounds of NSS. "SD" refers to standard deviation and is reported in parentheses. Observations are at the household level. Variables such as HH Size, MPCE (monthly per capita consumption expenditure), HH Average Age, No. of Male Children, No. of Female Children, No. of Educated Members, Total Land Possessed are continuous/ non-binary variables. All other variables are binary variables that assume the value 1 if the variable description is true and is 0 otherwise. Total Land Possessed is the sum of land owned and possessed, land leased in, land neither owned nor leased in and net of land leased out. Number of educated adults is obtained by counting the number of household members aged above 15 who have received more than higher secondary level education in the household, except for the 1993-94, 1999-2000 rounds where the number of educated adults refers to the number of adults who have received secondary or higher levels of education. For the 1993-94 round, there is no separate category called OBCs among the caste categories in the survey; therefore, non-SC/ST/OBC implies non-SC/ST for this round.

of non-SC/ST/OBC implies non-SC/ST and it is around 72%. The proportion of Hindu

households is found to be stable and around 78% across the years [13]. The average monthly per capita consumption expenditure (MPCE) for households ranges from Rs. 432 in 1993-94 to Rs. 2050 in 2011-12 with large standard deviations [14]. The average household age is around 30 years for the rounds. Table 2 also shows that the number of male children, on an average, are higher than the number of female children in households. Owing to differences in data collection method for education related information across the rounds, the number of educated members in a household are found to show large variation, on an average, across survey rounds. For 1993-94 and 1999-2000 rounds, we define an individual to be educated if she/he is above the age of 15 years and has completed at least secondary level of education. For all the subsequent rounds, individuals are defined as educated if they have completed at least higher secondary level education. Therefore, the number of educated individuals in a household, on an average, are found to be higher for 1993-94 and 1999-2000 rounds relative to the later rounds. However, for all rounds until 2004-05, the average number of educated individuals was not found to be greater than 1. We also find that around 6-8% of the surveyed households are headed by a widow. The average landownership is less than 1 hectare across all rounds. Lastly, the proportion of households with women aged 60 years or older lies between 16% in 1993-94 and 19% in 2011-12.

2.2 Data on Rainfall

The source for rainfall data is the gridded dataset of the Center of Climatic Research at the University of Delaware, which includes monthly precipitation values on 0.5 degree intervals in a longitude and latitude grid centered on 0.25 degree. This grid value is obtained by spatial interpolation using data from nearby weather stations and other sources of rainfall data. District-level monthly rainfall estimates are arrived at by averaging the monthly precipitation value of all the grid points lying within the geographic boundaries of a district in a year. The district specific monthly rainfall figures are available from 1971 to 2014. The geographic boundaries refer to the 1991 Indian census boundaries as districts have been split into two or more districts over time.

In our empirical analysis, we measure rainfall variability over time in a number of ways. Among them, the measure 'RainShock' has been used widely in the literature and also in the Indian context (Jayachandran (2006); Mahajan (2017)). This variable measures the rainfall shock experience in a district in any particular year. We follow Jayachandran (2006) to construct the 'RainShock' variable in our paper. The paper used 'RainShock' as an

[13] Muslims comprise the largest proportion of non-Hindus followed by Christians across all rounds.
[14] These figures are in current prices for the respective years.

instrument for crop yield and evaluated the consequent impact on wages [15] . According to the measure, normal and excess rainfall are treated as good shock and shortfall in rainfall as a bad shock. We consider the distribution of annual rainfall for each district over the years. The 'RainShock' variable equals one if the annual rainfall is above the eightieth percentile for that district, zero if it is between eightieth and twentieth percentile, or minus one if it is below the twentieth percentile.

We also use standardized rainfall in a district as an alternative continuous measure of rainfall variability over time. Standardized rainfall is calculated by subtracting long-term average rainfall in a district (1971–2014) from actual rainfall in a given year and dividing it by the standard deviation of rainfall in that district. Apart from 'RainShock' and 'Standardized Rainfall' i.e. two continuous measure of rainfall variability, we also consider a binary variable to capture a district's rainfall exposure in an alternative regression specification. This variable, which we call 'Adequate Rainfall Year' assumes the value 1 if the annual rainfall is above the twentieth percentile for that district in a particular year and is 0 otherwise.

2.3 Data on Historical Institutions

We use the geographical variation in the prevalence of the custom of widow burnings or *Sati* to understand whether historical cultural norms around widow persecution can potentially explain why widowhood influences the consumption of female assignable goods. Here the sample of our analysis is limited to the erstwhile Bengal Presidency and districts of neighbouring provinces bordering the Bengal Presidency in colonial India that are within the territorial jurisdiction of India at present. The data source of the geographical prevalence of the historical custom of *Sati*, *Dayabhaga* following regions and *Sena* kingdom territories is Sekhri (2019). We provide detailed description of the data and sample restrictions in a subsequent section (section 5) where we describe the role of historical institutions in influencing outcomes for women in households with a widow at present.

3 Descriptive Analysis

3.1 Empirical Specifications

Our baseline empirical specification relies on linear regression using a rich set of controls and state fixed effects. Therefore, conditional on controls we seek to compare households that

[15] Some previous works on India that use similar specifications include Jacoby and Skoufias (1997), Kochar (1999) and Rose (2001).

have a widow member to those that do not have any widows in terms of consumption of female assignable goods within states. Our baseline empirical specification is as follows:

$$y_{hst} = \beta Widow_{hst} + \gamma X_{hst} + \delta_{st} + \varepsilon_{hst} \tag{1}$$

Here, y_{hst} refers to monthly expenditure on women's clothing per adult female (or, female assignable goods) in household h in state s and round t of the data. We estimate regressions for each of the rounds t separately. $Widow_{hst}$ is a dummy variable that assumes the value 1 if the household has at least one widow and is 0 otherwise. Therefore, β is the coefficient of interest here. X_{hst} is the vector of controls in our analysis. For each of the rounds t, we include information on household size, the number of male and female children, the average age of the household, the number of adults who have received more than higher secondary level education, whether the household resides in rural/urban area, if the household is non-SC/ST/OBC, dummies for the household's religion, 30 days mean MPCE, total land possessed by the household as well as if the household head is a widow. In addition, we also include a dummy for whether the household has an elderly woman, that is, if the household has women members above the age of 60 years. We do so in order to control for the effect of the presence of elderly women in the household in an alternative specification. δ_{st} refers to state fixed effects for a regression using round t data (alternatively, we also include district fixed effects instead of state fixed effects). Lastly, we adjust the standard errors for heteroscedasticity.

Additionally, we consider households with younger widows with those that have older widows and compare households with different age distributions of widows to households that have no widow members. In particular, we consider only households that have exactly one widow for our analysis and we use information on the age of this widowed member. It is to be noted that across survey rounds, among households that have at least one widow, close to 95% households have exactly one widow member. We divide the households in four categories according to the age groups of widows - those between 18 and 49 year, 50 and 59 years, 60 and 69 years and 70 years or older. The reason we choose these categories is these age intervals have a more or less equal distribution of households with exactly one widow member. We create binary variables that assume the value 1 if a household has a widow belonging to one of these age groups and the omitted category is households with no widows here. Through this specification, we seek to understand whether households with different age distribution of widows exhibit different degrees of disadvantage in the consumption of female assignable goods relative to households that do not have a widow.

We also study heterogeneity between households with and without a widow regarding

spending on female assignable goods in terms of their caste, religion as well by income quantile. The estimation equation for each round t in this situation is of the following form:

$$y_{hst} = \beta_0 Widow_{hst} + \beta_1 x_{hst} + \beta_2 Widow_{hst} \times x_{hst} + \gamma X_{hst} + \delta_{st} + \varepsilon_{hst} \quad (2)$$

Here, x_{hst} would be indicators for household caste/religion/income quantile to which the household belongs in alternative specifications. Here, the coefficient β_2 of the interaction term, $Widow_{hst} \times x_{hst}$, is the coefficient of interest. X_{hst} in equation (2) includes all other controls except x_{hst}.

3.2 Selection into Widowhood

An important question that might arise is whether selection into widowhood is plausibly random. In other words, one might be concerned whether differences in expenditure on female assignable goods in households with and without a widowed woman is on account of widowhood or on account of other differences that pre-date widowhood. Now, this issue is potentially less of a concern for older women. This is because widowhood becomes more common as women and their spouses get older, especially since husbands are typically older than their wives in most marital unions in India [16]. However, as widowhood is relatively uncommon among younger women than among their older counterparts, one might be concerned whether younger currently widowed women are different from currently married women even before the start of their marital lives such that the former may have been matched with men who in turn were more disadvantaged and therefore faced higher mortality risk. In the absence of panel data that can help us track changes in a household's condition on account of change in a woman's marital status, we study whether currently widowed women are different from their currently married counterparts in terms of outcomes that are largely determined prior to marriage, but which can potentially influence matching in the marriage market. For this, we use data from the Demographic and Health Surveys (DHS) for India on 19-49 year old ever-married women for the years 1999-2000 and 2005-06, that roughly correspond to the period of our analysis using the NSS data. We use the DHS as it provides some information on these outcomes for women, unlike the NSS. The outcomes we consider are height (in centimetre) as a marker of childhood nutritional status, whether the childhood place of residence was a rural area as a proxy for limited access to public goods and amenities and whether the individual has no education. We report the differences in means (and proportions) across the sample of younger currently widowed and married women for these

[16] Remarriage following widowhood is very uncommon, especially for older women in India.

outcomes in Appendix Table A.1.

In general across both rounds of the DHS we find that even among women aged 19-49 years, women who are widowed are nearly 7-8 years older, on average, relative to women who are currently married. Therefore, we study the average differences in outcomes determined prior to marriage by 5 year age cohorts of the respondents. We find either very small (weakly significant) or no significant difference between the average heights of currently widowed and married women from both rounds of the DHS. In case, where difference exists, it is only around 0.2-0.3 centimetres (and largely at the 10% level of significance) and in one instance we find currently widowed women to be slightly taller than their currently married counterparts, although this difference is only around 0.4 centimetres and is significant only at the 10% level of significance (among 19-25 year old women in the 1999-2000 round of the DHS). The 1999-2000 round of DHS also reports whether the respondent's childhood place of residence was a rural area. We find no significant difference in the proportion of currently widowed and married women whose childhood place of residence was a rural area (no analogous information was available from the 2005-06 round of the DHS and is hence omitted here). However, the proportion of currently widowed women who had no education was 14-15 percentage points higher than the proportion of currently married women with no education across both rounds of the DHS and this difference is statistically significant. However, in our regression specifications we directly control for the educational attainment of adult household members. Therefore, this should plausibly account for differences in this variable across households. Overall, among 19-49 year old women, currently widowed and married women have no or negligible differences in terms of human capital endowments or childhood residence location. This provides some suggestive implication that women who are currently widowed are not necessarily likely to be more disadvantaged at the start of their marital lives relative to their currently married counterparts.

3.3 Descriptive Results

3.3.1 Baseline Results

Table 3 presents the results on the effect of the presence of a widow in the household on expenditure on female assignable goods for each of the rounds. The regression equation that we use for our estimation is the regression equation (1). Each of the panels corresponds to a different round of the NSS survey. In addition to our explanatory variable of interest, the dummy for whether a household includes at least one widow member, Column (1) controls for whether the household is in urban area and a dummy for if the household is non-SC/ST/OBC.

Column (2) includes the controls in Column (1) and in addition controls for whether the household is Muslim (the omitted category is non-Muslims, of which the largest religious group is Hindus), household size, MPCE, average age of household members, the number of male and female children, the number of educated adults, land owned by the household, a dummy for whether the household head is a widow and if the household is in Southern India (that is, the states of undivided Andhra Pradesh, Karnataka, Kerala and Tamil Nadu). Column (3) includes all controls as in Column (2) and in addition state fixed effects. We limit our sample to households in major states [17].

Across all columns for each of the rounds, we find that households that have at least one widow have lower monthly spending on adult women's clothing per adult female. We will rely on Column (3) of Table 3 for the purpose of interpretation of our results. We find that households with at least one widow are found to have lower spending on female assignable goods by around Rs. 4 in 1993-94, Rs. 6 in each of 1999-2000 and 2004-05, Rs. 9 in 2009-10 and Rs. 13 in 2011-12. Therefore conditional on all other controls, households with a widow are found to have lower spending on female assignable goods relative to those that do not have any widow even within the same state. Further, these findings are found to hold consistently across all survey rounds.

In column (3) of Table 3, our regression specification included state fixed effects. Alternatively, we can include district fixed effects instead of state fixed effects. We report these results in Panel A of Appendix Table A.2 [18]. We find that our results in Panel A of Appendix Table A.2 are similar to those that we found in Table 3. Therefore, inclusion of district fixed effects instead of state fixed effects does not appear to alter our results. In general we find that households that have widows have lower monthly expenditure on women's clothing per adult female relative to their counterparts without any widows by a magnitude of Rs. 6 - 13 across the rounds after the inclusion of district fixed effects.

We also test whether our findings are being driven by households with zero spending on female assignable goods. Panel B of Appendix Table A.2 re-estimates the effect of the presence of a widow using the specification in column (3) of Table 3, but by including only those households that have positive spending on women's clothing. We find that the results are similar to those obtained in Table 3. We also exclude the households comprising the top 0.5% of the expenditure on female assignable goods from our estimation sample and report the results in Panel C of Appendix Table A.2. We find that the results are similar to those

[17] Major states include Punjab, Uttarakhand, Haryana, Rajasthan, Uttar Pradesh, Bihar, West Bengal, Jharkhand, Orissa, Chattisgarh, Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

[18] We are not able to include district fixed effects for the 1993-94 round as identifying district information from the data, particularly, for the urban sample is not straightforward.

Table 3: Results: Outcome is Monthly Expenditure on Women's Clothing Per Adult Female & Men's Clothing Per Adult Male

	Female Assignable Good	Female Assignable Good	Female Assignable Good	Male Assignable Good
	(1)	(2)	(3)	(4)
Year: 1993-94				
HH has widow	-6.52***	-3.49***	-4.25***	4.41***
	(0.22)	(0.28)	(0.28)	(1.14)
R-squared	0.04	0.17	0.21	0.14
Observations	88,805	88,805	88,805	88,754
Year: 1999-00				
HH has widow	-7.84***	-5.48***	-6.15***	0.66***
	(0.25)	(0.35)	(0.34)	(0.13)
R-squared	0.04	0.12	0.16	0.20
Observations	91,805	82,751	82,751	81,812
Year: 2004-05				
HH has widow	-7.62***	-5.33***	-6.08***	0.14
	(0.26)	(0.28)	(0.27)	(0.10)
R-squared	0.02	0.12	0.18	0.28
Observations	93,046	92,567	92,567	90,678
Year: 2009-10				
HH has widow	-12.58***	-8.71***	-9.68***	0.40***
	(0.44)	(0.49)	(0.47)	(0.16)
R-squared	0.03	0.11	0.15	0.31
Observations	75,052	74,648	74,648	73,420
Year: 2011-12				
HH has widow	-22.08***	-12.39***	-13.84***	1.91***
	(0.65)	(0.69)	(0.66)	(0.50)
R-squared	0.04	0.22	0.28	0.12
Observations	75,045	74,933	74,933	73,798
Baseline Controls	✓			
All Controls		✓	✓	✓
State Effects			✓	✓

Note: Data source is various rounds of NSS. Observations are at the household level. Outcome variables in the first three columns is monthly expenditure on female assignable clothing per adult female. The outcome in the fourth column is monthly expenditure on male assignable clothing per adult male. Adult is defined to be individuals who are at least 15 years old at the time of the survey. Sample is restricted to include major states. Robust standard errors are reported in parentheses. ***, **, * refers to statistical significance at the 1%, 5% and 10% level of significance respectively. The omitted category is households that do not have a widow. "Baseline controls" include dummies for whether the household belongs to non-SC/ST/OBC category, resides in urban area. "All Controls" include "Baseline Controls" and additionally household size, dummy for if the household is Muslim, monthly per capita consumption expenditure (30 days), average age of the household members, the number of male and female children, total number of educated adults, dummy for whether the household head is a widow, the total land possessed by the household, dummy for if the household belongs to southern India (that is, the states of Karnataka, Kerala, undivided Andhra Pradesh and Tamil Nadu).

found in Table 3 here.

3.3.2 Male Assignable Goods

An issue with our findings on female assignable goods in Table 3 could be that the presence of a widow implies the potential loss of income on account of death of an earning member in the household and which could be influencing our results. Therefore, one could argue that it is overall household poverty that is higher in households that have a widow and which is likely contributing to lower female assignable good consumption in these households. We use the regression specification used in column (3) of Table 3 and use spending on male assignable goods instead as the outcome variable. We report the results in column (4) of Table 3. Therefore, column (4) of Table 3 shows how monthly expenditure on men's clothing per adult male differ across households with and without any widows. We consider spending on *dhoti* and *lungi* as expenditures on male assignable goods. We find from column (4) in Table 3 that across all rounds, expenditure on male assignable goods is higher in households that have at least a widow relative to those where there are no widow members although the magnitude is quite small. Further, there appears to be no significant difference between these types of households with regard to male assignable good consumption for the 2004-05 round. In summary, the expenditure on men's clothing per adult male does not appear to be significantly lower in households with at least a widow relative to those where no widows are present. This finding indicates potentially lower access to consumption resources within the household for women in households that have widows; while men's access to consumption resources do not appear to be lower in such households. Another alternative way of interpreting the result in column (4) of Table 3 is to see how the presence of widows influences the spending on commodities that only men consume (that is, men's clothing here). Column (4) of Table 3 shows that for most of the rounds, the expenditure on male assignable goods is higher in households with a widow. Therefore, married women appear to have higher bargaining power relative to widows within the household as the former can lower the consumption expenditure on goods that they do not consume. However, widows are not able to lower the consumption of goods that they cannot consume indicating their lower bargaining power here. This finding is similar in spirit of Deaton (1989) where reduction in the spending on adult goods on account of the presence of male children, but no change in the spending on such goods due to the presence of female children is taken as a potential indicator of gender discrimination against girls in intra-household resource allocation.

3.3.3 Older Age and Widowhood

The likelihood of being widowed increases with age. Recent studies have indicated the decline in women's resource share and bargaining power within the household as they age (see Calvi (2020) for example). Therefore, one might be concerned that it is the effect of older age and not widowhood that is influencing the decline in consumption of female assignable goods within the household. We address this issue in two ways.

Table 4: Results: Outcome is Monthly Expenditure on Women's Clothing Per Adult Female Controlling for Presence of Elderly Women & by Age of Widow

Panel A:					
Year:	1993-94	1999-00	2004-05	2009-10	2011-12
HH has widow	-3.29***	-4.76***	-4.72***	-7.46***	-12.68***
	(0.25)	(0.32)	(0.31)	(0.55)	(0.80)
Presence of Women 60 years or older	-1.92***	-2.75***	-2.57***	-4.18***	-2.11**
	(0.35)	(0.51)	(0.38)	(0.69)	(0.89)
R-squared	0.21	0.16	0.18	0.15	0.28
Observations	88,805	82,751	92,567	74,648	74,933
Panel B:					
Year:	1993-94	1999-00	2004-05	2009-10	2011-12
Widow 18-49 yrs	-2.93***	-4.72***	-5.13***	-8.27***	-11.74***
	(0.43)	(0.50)	(0.70)	(0.92)	(1.35)
Widow 50-59 yrs	-4.50***	-4.99***	-5.32***	-7.65***	-14.24***
	(0.36)	(0.48)	(0.45)	(0.86)	(1.19)
Widow 60-69 yrs	-4.51***	-6.70***	-6.27***	-9.98***	-14.01***
	(0.40)	(0.50)	(0.40)	(0.64)	(0.93)
Widow 70 yrs or older	-4.56***	-6.70***	-6.75***	-11.44***	-14.17***
	(0.45)	(0.56)	(0.42)	(0.73)	(1.00)
R-squared	0.21	0.16	0.18	0.15	0.28
Observations	87,884	81,879	91,574	73,964	74,223

Note: Robust standard errors are reported in parentheses. ***, **, * refers to statistical significance at the 1%, 5% and 10% level of significance respectively. The omitted category is household with no widow. The regression specification is analogous to Column (3) of Table 3. For all other details, please see table notes of Table 3. For Panel B, the sample is restricted to include households that have exactly one widow and those that have no widows.

First, we include a dummy that assumes the value 1 if the household includes women aged 60 years or older in the survey year as an additional control in our regression. Panel A of Table 4 presents the results using the regression specification in column (3) of Table 3 and including the additional control of the presence of elderly women in the household.

We find that the inclusion of the dummy of the presence of elderly women does not alter our baseline findings from Table 3. We find that households that have at least one widow have lower expenditure on female assignable goods relative to households that do not have a widows, even after we control for the presence of women aged 60 years or older in the household. However, the magnitude of the coefficients on presence of a widow and presence of elderly women in the household are close to each other; indicating that we cannot say that widowhood has a larger negative impact on women's access to consumption relative to older age from our findings in Panel A of Table 4. But it is also to be noted that we do not intend to claim that it is widowhood that has a larger negative effect on women and not older age. Rather, our aim in Table 4 is to show that even after we account for the presence of elderly women in the household, widowhood continues to have a significant negative effect on women's consumption within the household [19].

Secondly, we consider whether any potential heterogeneous effects exist for households with younger and older widows. We use the regression specification in column (3) of Table 3, and include dummies for households that have widows belonging to different age cohorts (taking households with no widows as the omitted category as before). We limit our sample to households with exactly one widow and those with no widows at all here. Our results are presented in Panel B of Table 4. We find that households that have a widow, irrespective of their age groups, are found to have lower consumption of female assignable goods relative to those without any widows. However, the point estimates on the dummy variables of the age categories of the widows do not significantly differ from each other and these findings appear to hold over time. Therefore, we find that presence of a widow is associated with lower spending on female assignable goods and that households with younger widows do not appear less disadvantaged relative to households with older widows in this regard. Our findings are suggestive of the increase in vulnerability that women are likely to face on account of widowhood that is distinct from the effect of older age.

3.3.4 Heterogeneity Analysis

We study whether our findings on the effect of widowhood on consumption of female assignable goods within the household differ by household caste and religion. This is because significant differences, in general, exists in cultural norms, rituals around widowhood among different caste categories and religions. We use the empirical specification in equation (2) and in col-

[19] Alternatively, we have used the age of 45 years or older to define elderly women in the household as has been used in studies by (Chen and Drèze, 1992) and our results (although not shown here) remain similar to those found in Panel A of Table 4.

Table 5: Heterogeneity Analysis: Outcome is Monthly Expenditure on Women's Clothing Per Adult Female

Year:	1993-94	1999-00	2004-05	2009-10	2011-12
Panel A:					
HH has widow × Non-SC/ST/OBC	-2.05***	-1.98***	-0.76	-3.11***	-9.12***
	(0.38)	(0.54)	(0.61)	(0.99)	(1.34)
R-squared	0.21	0.16	0.18	0.15	0.28
Observations	88,805	82,751	92,567	74,648	74,933
Panel B:					
HH has widow × Muslim	-2.47***	3.69***	3.23***	4.22***	6.34***
	(0.62)	(0.88)	(0.70)	(1.31)	(1.68)
R-squared	0.21	0.16	0.18	0.15	0.28
Observations	88,805	82,751	92,567	74,648	74,933

Note: Robust standard errors are reported in parentheses. ***, **, * refers to statistical significance at the 1%, 5% and 10% level of significance respectively. The omitted category is household with no widow. The regression specification is analogous to Column (3) of Table 3. For all other details, please see table notes of Table 3.

umn (3) of Table 3 for studying these potential heterogeneous effects. We report the results in Table 5.

Panel A of Table 5 reports the heterogeneous effects by caste. Across all rounds, we find that non-SC/ST/OBC households that have a widow have lower monthly spending on women's clothing per adult female relative to their counterparts that are SC/ST/OBC [20]. Therefore, the decline in spending on female assignable goods in households that have a widow relative to those that do not is found to be larger for mostly upper caste households. We obtain, more or less, similar finding across rounds in this regard; with the exception of 2004-05 where the coefficient reported is insignificant, although it is in the same direction as the other rounds. In general we find that the gap between households that have a widow and those that do not among non-SC/ST/OBC households in terms of spending on female assignable goods is larger by nearly Rs. 2 - 3 relative to their counterparts among the SC/ST/OBCs. The figure for 2011-12 is larger in absolute value than those of the earlier rounds and a potential reason could be that female clothing includes additional items for this round as was noted earlier.

Panel B of Table 5 reports the heterogeneous effects by religion. We compare households that are Muslim with those that are non-Muslim, of which the largest majority comprises of Hindu households. Except 1993-94, we find that the decline in spending on female assignable goods in households that have a widow relative to those that do not is larger for non-Muslim

[20] For 1993-94, non-SC/ST/OBC implies non-SC/ST.

households; specifically mostly Hindu households. In particular, Muslim households with a widow have higher spending on female assignable goods by Rs. 3 - 6 across rounds relative to non-Muslim households.

Our findings in Panels A and B here indicate that it is possible that differences in customs and rituals surrounding widowhood are plausible reasons regarding why we find lower differences between households that have a widow and those that do not among SC/ST/OBCs and Muslims with regard to consumption of female assignable goods.

Table 6: Income Groups: Outcomes are Monthly Expenditure on Women's (Men's) Clothing Per Adult Female (Male)

Year: 2011-12		
	(1)	(2)
Panel A: Female Clothing Per Adult Female		
HH has widow × Middle 40% MPCE Group	-4.75***	-4.59***
	(0.80)	(0.83)
HH has widow × Top 30% MPCE Group	-20.28***	-19.84***
	(1.64)	(1.44)
R-squared	0.20	0.22
Observations	74,933	74,933
Panel B: Male Clothing Per Adult Male		
HH has widow × Middle 40% MPCE Group	-0.21	-0.12
	(0.59)	(0.57)
HH has widow × Top 30% MPCE Group	1.83*	2.06**
	(0.94)	(0.92)
R-squared	0.12	0.17
Observations	73,798	73,798
All Controls	✓	✓
State fixed Effects	✓	
District Fixed Effects		✓

Note: Robust standard errors are reported in parentheses. ***, **, * refers to statistical significance at the 1%, 5% and 10% level of significance respectively. The omitted category is household with no widow and for income category the omitted category is the bottom 30% MPCE households. The regression specification is otherwise analogous to Columns (3) and (4) of Table 3. For all other details, please see table notes of Table 3.

We also study how the expenditure on female and male assignable goods varies by different income categories. The motivation of this exercise is to see whether households that are

poorer are also more likely to have lower spending on female assignable goods on account of the presence of at least one widowed woman or whether it closely resembles what we have found in terms of the heterogeneity analysis by social groups in Table 5 (as usually upper caste, Hindu households are also relatively richer in Indian society relative to lower castes and Muslim households). For this exercise, we consider the data from the latest round of the NSS Consumption Expenditure Survey, 2011-12 that are available to us and divide households into three broad income categories based on their MPCE- those comprising the bottom 30%, those lying between 30% to 70% (middle 40%) and the those comprising the top 30% of the distribution of MPCE.

Table 6 presents the regression results where expenditure on female assignable goods is the outcome variable of interest in Panel A, while the expenditure on male assignable goods is the outcome variable of interest in Panel B. We interact the dummy for the presence of at least one widow in the household with the dummies for belonging to the middle 40% and the top 30% of the MPCE distribution (households belonging to the bottom 30% of the MPCE distribution are taken as the omitted category here). The coefficient of the interaction between the dummy for the presence of at least one widow and the household belonging to the top 30% of the MPCE distribution can be interpreted as the difference between households with a widow and those without any widowed women between the top 30% and the bottom 30% of the MPCE distribution. An analogous interpretation holds for the coefficient of the interaction between the dummy for the presence of at least one widow and the household belonging to the middle 40% of the MPCE distribution. Column (1) in Panel A shows us that the coefficient of both the interaction terms are negative and statistically significant. In other words, we find that the reduction in spending on female assignable goods in households that have a widow relative to those without any widows is higher among households that belong to the top 30% and the middle 40% of the MPCE distribution relative to those belonging to the bottom 30% of the MPCE distribution. The absolute magnitude of the coefficient also appears to be larger for households that belong to the top 30% of the MPCE distribution indicating that the gap in spending on female assignable goods between households that have a widow and those without any widow is the largest among the richest households. In Column (1) of Panel B, we report similar results when our outcome of interest is spending on male assignable goods. Our results are opposite to what we have obtained for spending on female assignable goods. We find a small positive coefficient for the interaction of the dummy for the presence of at least one widow and the household belonging to the top 30% of the MPCE distribution. This indicates that households with at least one widow have higher spending on male assignable goods than households without widowed women and this difference is higher for households that belong to the top 30% than for those households that belong to

the bottom 30% of the MPCE distribution. In Column (2) of Table 6 we re-estimate the same regressions as in column (1) of the table, but by including district fixed effects instead of state fixed effects. Our results are analogous to those we found in column (1) here. These results indicate that overall household poverty on account of widowhood is unlikely to be the reason why households with a widowed woman have lower monthly spending on female assignable goods. This indicates potential within-household discrimination against widowed women in accessing consumption resources (as measured by female clothing here).

4 Widowhood and Rainfall Shocks

Our empirical analysis has examined how the expenditure on assignable goods for households with a widow varies across income categories in a cross-section of households. It is also equally important to investigate what happens to the consumption of female and male assignable goods over time as households face an income shock, such as climatic shock. This paper addresses this question by pooling the NSS household surveys for the years 1993-94, 1999-2000, 2004-05, 2009-10 and 2011-12. It has been recognized in the literature that climatic shocks may impact men and women differently. But the literature does not highlight much about the differential impact of climatic shock for widowed women relative to their married counterparts. In this paper, we explore this using the rainfall variability/rainfall shock in Indian districts over time.

Relying on linear regression and using a rich set of controls, district and time fixed effects, we examine how the consumption of private assignable goods for women and men vary between households with and without widows and between districts that experience a "good" rainfall with those experiencing a relatively "bad" rainfall. As the rainfall shock is likely to affect the consumption of assignable clothing by altering the agricultural output or earning from agriculture, we focus on the rural areas and choose the rural sample for this exercise. The regression specification is as follows:

$$Y_{hdt} = \beta Widow_{hdt} + \alpha Rain_{dt} + \theta Widow_{hdt} \times Rain_{dt} + \gamma X_{hdt} + \delta_d + \tau_t + \epsilon_{hdt} \qquad (3)$$

Here, h refers to household, d refers to the district and t refers to the round/time period (t =1993-94, 1999-2000, 2004-05, 2009-10 and 2011-12). The dependent variable Y_{hdt} stands for the real monthly expenditure on women's (men's) clothing per adult female (male). The nominal expenditure figures have been deflated by state specific Consumer Price Index for Agricultural Laborers (CPI-AL) in order to convert it into real terms. We obtain state-

specific CPI-AL figures from the EPW database. $Widow_{hdt}$ is a dummy variable that assumes the value 1 if the household has at least one widow and is 0 otherwise. The variable $Rain_{dt}$ stands for the rainfall variability or rainfall exposure of a district at any time period. As mentioned earlier, we have used three alternative measures of rainfall exposure across different regression specifications. These are 'RainShock', 'Standardized Rainfall', and a dummy variable used to represent adequate rainfall years (denoted as 'Adequate Rainfall'). We interact $Rain_{dt}$ with $Widow_{hdt}$ in order to investigate how rainfall shock/ rainfall variability impacts spending on female assignable goods depending on whether a widow is present in the household and if there are different implications for spending on male assignable goods for such households. X_{hdt} is a vector of controls in our analysis. For each of the rounds t, we include information on household size, the number of male and female children, the average age of the household, the number of adults who have received more than higher secondary level education, whether the household resides in rural/urban area, if the household is non-SC/ST/OBC, dummies for the household's religion, 30 days real MPCE and total land possessed by the household. These controls are identical to those used in our baseline analysis before. δ_d and τ_t denote the district fixed effects and time fixed effects respectively.

Panel A of table 7 presents the results on the effect of the district specific rainfall shock as well as the presence of a widow in the household on expenditure on female assignable goods for the household level data pooled across five NSS rounds. It also reports the differential impact of a rainfall shock on spending on female assignable goods between households with and without a widowed woman. The five columns in the table correspond to five different regression specifications. In all the five columns in Panel A, we report the coefficients of the dummy of whether the household has at least a widow, $Widow_{hdt}$, 'RainShock' variable and the interaction between 'RainShock' and $Widow_{hdt}$. The first column shows the results without controlling for any other variables, district specific dummies and time dummies. In the second column, we report the results after including the other control variables in the set of regressors but the district and time dummies are excluded. In addition to the control variables, column (3) controls for the district dummies, column (4) controls for the time dummies and in column (5) we include both the district dummies and time dummies. We limit our sample to households in major states.

Across all specifications (i.e. all columns), we find that the districts that face a positive rainfall shock (i.e. a rise in rainfall) are also the ones experiencing significantly larger increase in the consumption of female assignable goods in real terms. As before, we find that households that have at least one widow have statistically significant lower spending (in real terms) on female assignable goods across all specifications. Moreover, it turns out that the positive impact of an advantageous rainfall shock is significantly less (at 1% level for all

Table 7: Impacts of Rainfall Shocks on Monthly Expenditure on Women's Clothing Per adult Female by Presence of Widow

	(1)	(2)	(3)	(4)	(5)
Panel A:					
HH has widow	-4.02***	-3.06***	-3.40***	-3.08***	-3.42***
	(0.15)	(0.13)	(0.11)	(0.13)	(0.11)
Rainfall Shock	1.94***	1.39***	0.53**	1.18***	0.18
	(0.42)	(0.33)	(0.23)	(0.36)	(0.24)
HH has widow × Rainfall Shock	-0.64***	-0.63***	-0.47***	-0.66***	-0.48**
	(0.21)	(0.20)	(0.19)	(0.20)	(0.19)
R^2	0.01	0.09	0.16	0.09	0.16
Observations	250,247	248,165	248,165	248,165	248,165
Panel B:					
HH has widow	-4.02***	-3.05***	-3.41***	-3.07***	-3.42***
	(0.15)	(0.13)	(0.11)	(0.13)	(0.11)
Standardized Yearly Rainfall	1.29***	0.75***	0.44***	0.44*	-0.01
	(0.28)	(0.22)	(0.16)	(0.25)	(0.18)
HH has widow × Standardized Yearly Rainfall	-0.48***	-0.43***	-0.34***	-0.45***	-0.35***
	(0.14)	(0.13)	(0.13)	(0.13)	(0.13)
R^2	0.01	0.10	0.16	0.10	0.16
Observations	250,247	248,165	248,165	248,165	248,165
Panel C:					
HH has widow	-3.50***	-2.45***	-2.91***	-2.43***	-2.90***
	(0.28)	(0.26)	(0.24)	(0.26)	(0.24)
Adequate Rainfall Year	2.80***	2.67***	1.01***	2.48***	0.71**
	(0.64)	(0.49)	(0.30)	(0.50)	(0.33)
HH has widow × Adequate Rainfall Year	-0.56**	-0.71***	-0.57**	-0.76***	-0.60**
	(0.28)	(0.26)	(0.26)	(0.26)	(0.26)
R^2	0.01	0.09	0.16	0.09	0.17
Observations	250,247	248,165	248,165	248,165	248,165
All Controls		✓	✓	✓	✓
District Fixed Effects			✓		✓
Year Fixed Effects				✓	✓

Note: Data source is pooled NSS Consumption Expenditure Surveys 1993-94, 1999-2000, 2004-05, 2009-10, 2011-12. Robust standard errors clustered at the district level reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance respectively. All other Controls are as in Column (2) of Table 3. "Rainfall Shock" is a discrete variable that assumes the value 1 if the annual rainfall is above the eightieth percentile for that district,0 if it is between eightieth and twentieth percentile, or -1 if it is below the twentieth percentile. "Standardized Yearly Rainfall" is a continuous variable and is calculated by subtracting long-term average rainfall in a district (1971–2014) from actual rainfall in a given year and dividing it by standard deviation of rainfall in that district. "Adequate Rainfall Year" is a binary variable that assumes the value 1 if the annual rainfall is either excessive or normal (i.e. annual rainfall is above eightieth percentile or between eightieth and twentieth percentile) for a district in a particular year and 0 otherwise. All nominal expenditure figures have been deflated by state specific Consumer Price Index for Agricultural Laborers (CPI-AL) in order to convert them into real terms.

specifications) for a household with a widowed woman compared to a household without a widowed woman. In column (5), where we report the results for the most comprehensive specification (i.e. with all controls as well as district and time dummies), we find that the households with at least one widow are found to have lower monthly spending on female assignable goods (in real values) by the amount of Rs. 3.4. This magnitude is equivalent to almost 20% of the average real monthly expenditure on female assignable clothing per adult female (calculated from the entire sample of all major states). The magnitude by which a positive rainfall shock further reduces the consumption of female assignable clothing for the

households with a widowed woman is almost 3% of the average real consumption of female assignable clothing. This magnitude is not negligible and clearly shows that a good rainfall outcome worsens the gap in the consumption of female assignable clothing per adult female between households with and without widowed women.

The five columns in Panel B of Table 7 are exactly the same as those in Panel A of the table i.e. they correspond to the same specifications. The only difference is that the variable 'RainShock' is replaced by the district wise standardized yearly rainfall. Again, it turns out that the districts with better rainfall exposure (measured through higher standardized yearly rainfall) experience significantly larger increase in the consumption of female assignable goods but the increase is significantly less for households with widowed women relative to households without any widowed woman. The amount by which a household with a widow consumes less of female assignable clothing is 20% of the average real monthly consumption of female assignable clothing. This is exactly same as what we have found from Panel A. The magnitudinal difference of the effect of a higher standardized rainfall on female assignable clothing between households with and without widowed women is almost 2% of the average real monthly consumption of female assignable goods. The results remain qualitatively similar if we use the dummy for adequate rainfall years instead of the continuous variables such as 'RainShock' or standardized yearly rainfall (Panels C Table 7).

As we shift our attention to male assignable clothing, it turns out that the consumption of male assignable goods is significantly larger (at 1% level) for households with at least one widowed woman compared to households without any widows. The results are reported in Table 8. This finding from the pooled data is largely similar to what we have found when we analyse the individual cross-section for each round. The five columns in Panel A of Table 8 correspond to five different specifications and these are exactly the same as Panel A of Table 7. The only difference between Table 7 and Table 8 is the dependent variable. As we focus on the most detailed specification in Panel A of Table 8 (i.e. column 5 which includes all control variables, district as well time dummies), it turns out that the impact of a positive rainfall shock (measured through the 'RainShock' variable) on the overall consumption of male assignable clothing is insignificant. But a positive rainfall shock impacts households with and without a widowed woman differently. A positive rainfall shock has a statistically significant positive effect on the spending on male assignable goods in households with at least one widow relative to household without a widow. The gap increases by almost 3% of the average monthly real expenditure on male assignable clothing per adult male. Therefore, positive rainfall shocks appear to improve the spending on male assignable goods by a larger magnitude in households with a widow relative to those without any widowed women. This finding is in contrast to what we found for spending on female assignable goods from Table

Table 8: Impacts of Rainfall Shocks on Monthly Expenditure on Men's Clothing Per adult Male by Presence of Widow

	(1)	(2)	(3)	(4)	(5)
Panel A:					
HH has widow	0.47***	0.43***	0.48***	0.37***	0.42***
	(0.12)	(0.09)	(0.08)	(0.09)	(0.08)
Rainfall Shock	0.78***	0.60***	0.30***	0.41***	0.01
	(0.16)	(0.16)	(0.12)	(0.17)	(0.12)
HH has widow × Rainfall Shock	0.26***	0.26***	0.20**	0.25***	0.20**
	(0.10)	(0.10)	(0.08)	(0.09)	(0.08)
R^2	0.004	0.09	0.21	0.10	0.22
Observations	241,405	239,328	239,328	239,328	239,328
Panel B:					
HH has widow	0.49***	0.45***	0.50***	0.40***	0.44***
	(0.12)	(0.09)	(0.08)	(0.09)	(0.08)
Standardized Yearly Rainfall	0.58***	0.41***	0.18**	0.22*	-0.12
	(0.11)	(0.12)	(0.09)	(0.13)	(0.09)
HH has widow × Standardized Yearly Rainfall	0.29***	0.30***	0.21***	0.29***	0.21***
	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)
R^2	0.005	0.09	0.21	0.10	0.22
Observations	241,405	239,328	239,328	239,328	239,328
Panel C:					
HH has widow	-0.002	-0.005	0.20*	-0.02	0.17*
	(0.14)	(0.12)	(0.10)	(0.11)	(0.10)
Adequate Rainfall Year	1.31***	1.30***	0.58***	1.04***	0.23*
	(0.23)	(0.22)	(0.14)	(0.21)	(0.13)
HH has widow × Adequate Rainfall Year	0.56***	0.50***	0.33***	0.46***	0.30***
	(0.15)	(0.14)	(0.12)	(0.13)	(0.11)
R^2	0.01	0.09	0.21	0.11	0.22
Observations	241,405	239,328	239,328	239,328	239,328
All Controls		✓	✓	✓	✓
District Fixed Effects			✓		✓
Year Fixed Effects				✓	✓

Note: Data source is pooled NSS Consumption Expenditure Surveys 1993-94, 1999-2000, 2004-05, 2009-10, 2011-12. Robust standard errors clustered at the district level are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance respectively. All other Controls are as in Column (2) of Table 3. "Rainfall Shock" is a discrete variable that assumes the value 1 if the annual rainfall is above the eightieth percentile for that district,0 if it is between eightieth and twentieth percentile, or -1 if it is below the twentieth percentile. "Standardized Yearly Rainfall" is a continuous variable and is calculated by subtracting long-term average rainfall in a district (1971–2014) from actual rainfall in a given year and dividing it by standard deviation of rainfall in that district. "Adequate Rainfall Year" is a binary variable that assumes the value 1 if the annual rainfall is either excessive or normal (i.e. annual rainfall is above eightieth percentile or between eightieth and twentieth percentile) for a district in a particular year and 0 otherwise. All nominal expenditure figures have been deflated by state specific Consumer Price Index for Agricultural Laborers (CPI-AL) in order to convert them into real terms.

7 where positive rainfall shocks improved spending on female assignable goods by a lesser magnitude in households where at least a widow was present. These findings indicate that a positive income shock such as a good rainfall outcome may make widows more vulnerable instead of improving their relative position in the household.

In Panels B and C of Table 8, we replace the 'RainShock' variable by standardized yearly rainfall and a dummy for adequate rainfall year respectively. The reporting of the results is identical to Panel A of the table. For all these two panels in Table 8 and for every specification (i.e. for every column), the coefficient of the dummy of the household with a widowed woman

and the coefficient of the interaction term between the dummy of household with a widowed woman and the rainfall exposure variable turns out to be positive and statistically significant as in Panel A.

In Appendix Table A.3 we report findings on how rainfall related shocks or variability can influence spending on private assignable goods by considering alternative deflators and sample restrictions. We use 'RainShock' and standardized yearly rainfall as measures of rainfall shock and variabililty respectively as in Panels A and B in Tables 7 and 8 and use the specification in column (5) of these tables as the regression specification with the full set of controls and fixed effects. We find that if we restrict the sample to only include households with positive expenditure on private assignable goods or use all-India CPI deflator instead of state-specific deflator to convert nominal expenditure figures over time to real expenditure figures, our findings remain largely similar to those obtained in Tables 7 and 8 here. In other words, our results on the differential impact of rainfall shock on spending on female and male assignable goods between households with and without any widowed women are more of less robust to alternative specifications of the sample and variable definitions.

5 Mechanisms: Plausible Role of Historical Institutions

We investigate the role of historical institutions concerning widowed women's status in influencing the consumption of female and male assignable goods and why positive income shocks may fail to improve spending on female assignable goods in a household with a widow relative to when no widows are present.

5.1 The Custom of Widow Burnings

The custom of burning a recently widowed woman alive on her dead husband's funeral pyre or *Sati* was widely prevalent in the erstwhile Bengal Presidency particularly during the 18th and early 19th centuries until it was outlawed in 1829 by the British. Therefore, to understand the role of historical customs and institutions around widowhood, we limit our sample of analysis to include modern districts that can be roughly matched to the historic districts of Bengal Presidency as well as districts that share borders with those in the erstwhile Bengal Presidency during the early 19th century. Our sample, therefore, includes districts that lie in present-day West Bengal, Bihar, Jharkhand, Odisha and eastern Uttar Pradesh in alternative specifications (Figure 1 here shows the contours in bold of modern states of West Bengal, Bihar, Jharkhand and Odisha in India that roughly comprised the historic Bengal Presidency). Sekhri (2019) identifies historic districts in Bengal Presidency

Figure 1: Extremely High Widow Burning Districts in Bengal Presidency during 1815-1828 following Sekhri (2019)

with varying levels of prevalence of widow burnings [21]. We categorize historic districts in Bengal Presidency with extremely high widow burning prevalence as those with more than 500 reported cases of *Sati* between 1815 and 1828. These include Barddhaman, Howrah, Hooghly and Nadia districts that currently lie in West Bengal (Figure 1 depicts these districts

[21] Although widow burnings took place in other parts of India, it was most widely prevalent in the Bengal Presidency during the colonial era.

in green). We compare these districts with other districts in modern day West Bengal [22] as well as districts that have been carved out of the historic districts of Purnea, Manbhum, Santal Parganas and which lie in modern day Bihar/Jharkhand and those that have been carved out of the historic district of Balasore in Odisha. The districts in the comparison group that lie in the present-day states of Bihar or Jharkhand and Odisha share boundaries with the present-day state of West Bengal. As such, these districts comprised the erstwhile Bengal Presidency or its immediate border districts and share similar historical backgrounds.

We create a binary variable as an indicator of extremely high widow burning prevalence in the past at the district level. Following Sekhri (2019), districts with extremely high widow burning prevalence are coded as 1 and all other districts in our sample assume the value 0. We now study how the consumption of private assignable goods for women and men vary between households with and without any widowed women and between districts that had extremely high prevalence with relatively low prevalence of widow burnings in the past. Table 9 shows us these associations.

We report the findings from the 1999-2000 round in Panels A and B and from the 2004-2005 rounds of NSS consumption expenditure surveys in Panels C and D. Our regression specification is similar to Column (2) of Table 3. We find that consumption of female assignable goods is lower in households with a widow, from Panels A and C across the two NSS survey rounds. However, households with at least one widowed woman in districts with extremely high prevalence of widow burnings in the past appear to have lower consumption of female assignable goods (Column (1) of Panel A). Although we continue to find that households with at least a widowed woman in districts with extremely high widow burnings in the past have lower consumption of female assignable goods, this finding is no longer statistically significant when we include state fixed effects (Column (2) of Panel A) or use an alternative round of the NSS consumption expenditure survey (Panel C).

With regard to the consumption of male assignable goods, we find that households with at least a widowed woman have higher consumption of male assignable goods (Panel B) and this is also statistically significant for the 2004-05 round of the NSS survey (Panel D). Interestingly, across NSS survey rounds and even after the inclusion of the state fixed effects, we find that households with at least a widow report higher consumption of male assignable goods in districts with extremely high prevalence of widow burnings in the past (Panels B and D). In other words, the difference in spending on male assignable clothing between households that have a widow and with no widowed woman is higher in districts with historically very high prevalence of widow burning relative to districts with relatively low prevalence of widow

[22] We exclude the northern districts of Jalpaiguri, Darjeeling and Koch Bihar and the wholly urban district of Kolkata.

Table 9: Associations of Widowhood, Consumption of Private Assignable Goods with Historical Widow Burning Prevalence in Bengal Presidency

Year: 1999-2000	(1)	(2)
Panel A: Female Assignable Clothing:		
HH has widow	-5.35***	-5.74***
	(0.78)	(0.78)
Extremely High Widow Burning	7.61***	5.83***
	(0.92)	(0.95)
HH has widow × Extremely High Widow Burning	-2.75*	-2.21
	(1.56)	(1.57)
R^2	0.196	0.204
Observations	7,036	7,036
Panel B: Male Assignable Clothing:		
HH has widow	0.35	0.33
	(0.32)	(0.32)
Extremely High Widow Burning	-0.07	-0.24
	(0.22)	(0.24)
HH has widow × Extremely High Widow Burning	1.66***	1.69***
	(0.61)	(0.61)
R^2	0.062	0.065
Observations	6,989	6,989
Year: 2004-2005	(1)	(2)
Panel C: Female Assignable Clothing:		
HH has widow	-6.37***	-5.75***
	(0.90)	(0.88)
Extremely High Widow Burning	0.64	0.64
	(0.89)	(0.92)
HH has widow × Extremely High Widow Burning	-0.78	-1.36
	(1.43)	(1.43)
R^2	0.334	0.349
Observations	8,456	8,456
Panel D: Male Assignable Clothing:		
HH has widow	0.52*	0.72**
	(0.30)	(0.30)
Extremely High Widow Burning	-1.70	-1.48***
	(0.16)	(0.17)
HH has widow × Extremely High Widow Burning	1.09**	0.88**
	(0.45)	(0.45)
R^2	0.091	0.114
Observations	8,267	8,267
State Fixed Effects		✓

Note: Data source is 1999-2000 and 2004-05 rounds of the NSS Consumption Expenditure Survey. Robust standard errors reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance respectively. The sample is restricted to include districts in Bengal Presidency that are currently in India. These include the state of West Bengal (excluding Darjeeling, Koch Bihar and Jalpaiguri districts), districts carved out of the erstwhile Purnea, Manbhum, Santal Parganas in present day Bihar/Jharkhand and Balasore in present day Odisha. Extremely high widow burning districts include Bardhaman, Howrah, Hooghly and Nadia districts of present day West Bengal. We exclude the district of Kolkata here. Controls are as in Column (2) of Table 3 excluding dummy for southern zone. Column (2) here includes state fixed effects where identification is achieved through comparison of districts within West Bengal.

burnings in the past. Given our sample, inclusion of state fixed effects mean that we are attempting to identify differences in our outcome within the modern state of West Bengal as this is the only state in our sample with variation in the prevalence of widow burnings across

districts. Therefore, our findings from Table 9 are suggestive of higher consumption of male assignable goods in households with a widow at present in districts with very high prevalence of *Sati* in the past, with no corresponding difference for the consumption of female assignable goods across these types of households or districts, even within the same modern state of West Bengal. Hence, this is suggestive of greater gaps between households with a widow and with no widowed women in terms of consumption of private assignable goods favouring men at present in districts with extremely high prevalence of *Sati* relative to lower prevalence of *Sati* in the past.

5.2 Historical Legal Systems Governing Women's Inheritance Rights

Sekhri (2019) finds that historically high prevalence of *Sati* in the Bengal Presidency is associated with the *Dayabhaga* legal school being followed in Bengal. According to Anderson and Genicot (2015), *Dayabhaga* school was prevalent in Bengal and Assam; whereas the other legal school, the *Mitakshara* school was prevalent in the rest of India. These different legal schools governed inheritance laws historically, among other matters. The *Mitakshara* school had several sub-schools namely the *Dravida*/Madras sub-school followed in southern India, the Maharashtra/Bombay sub-school followed in Maharashtra, the Banares sub-school followed in Uttar Pradesh and the Mithila sub-school followed in Bihar and Odisha. Although the *Dravida*/Madras and Maharashtra/Bombay sub-schools of the *Mitakshara* school was somewhat more egalitarian towards women inheriting ancestral property, neither the *Mitakshara* nor the *Dayabhaga* schools in general guaranteed equal inheritance rights to women. Anderson and Genicot (2015) note that the 1956 amendment to the Hindu Succession Law sought to be an improvement in these schools of law with regard to women's inheritance rights. Subsequently some states passed amendments to the 1956 Hindu Succession Act and these included states that traditionally followed the *Dravida*/Madras and Maharashtra/Bombay sub-schools of the *Mitakshara* school. These include Kerala in 1976, Andhra Pradesh in 1986, Tamil Nadu in 1989, Karnataka and Maharashtra in 1994. Agarwal (1995) provides a comprehensive discussion of the gender inequalities in state level land and tenancy acts prior to Hindu Succession Amendment Act of 2005 that extended equal inheritance rights to daughters throughout India, including for agricultural land. Since our sample of analysis includes the present-day West Bengal and the neighbouring districts in Bihar/Jharkhand, Odisha and in some instances eastern Uttar Pradesh, our sample excludes the reform states of Kerala, Andhra Pradesh, Tamil Nadu, Karnataka and Maharashtra. Further, we only consider NSS survey rounds before the implementation of the Hindu Succession Amendment Act of 2005. Because of these sample restrictions, our analysis attempts to abstract away

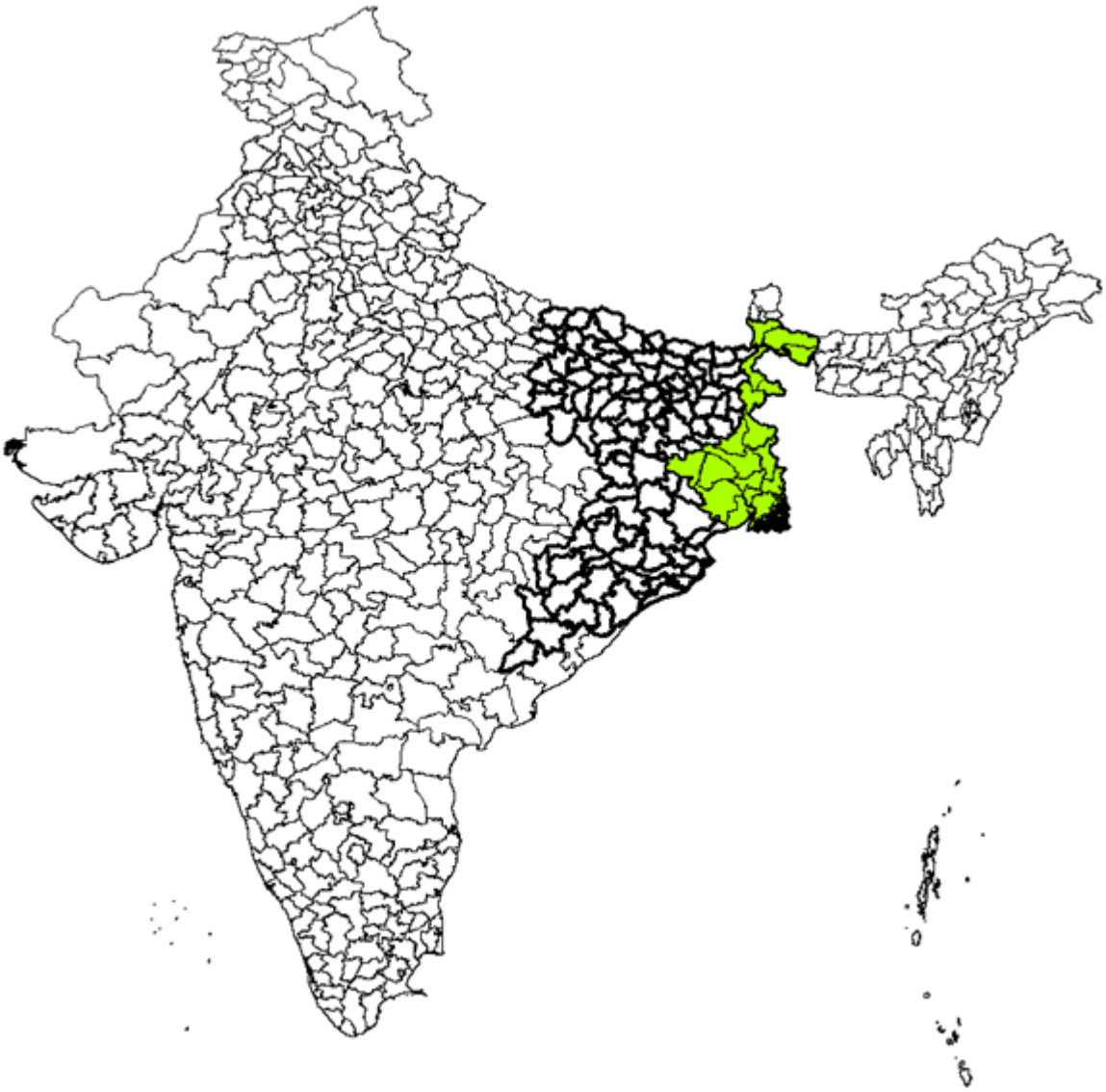

Figure 2: Historic Dayabhaga school of law following region

from the potential implications of reforms to inheritance laws prior to 2005 or after that (Figure 2 shows West Bengal in green as the *Dayabhaga* following region and the neighbouring districts in bold that comprise the *Mitakshara* following regions in our estimation sample.).

Now, one of the key features of difference between the *Mitakshara* and the *Dayabhaga* schools was in terms of inheritance laws. Under the *Mitakshara* school, the widow had no right to inherit the deceased husband's property and in the absence of sons, son's sons, or son's son's sons etc., the property passed through the brothers of the deceased and their descendants. However, under the *Dayabhaga* school, in the absence of male heirs, the widow

of the deceased had the right to inherit his property. The reason for this difference between the *Mitakshara* and the *Dayabhaga* schools is largely attributed to the interpretation by *Jimutavahana*, who was an eminent jurist from the *Radha* region of Bengal during the reign of *Vijayasena* in the 12th century (Sekhri, 2019). Sekhri (2019) finds that although widow burnings were practised in many regions in India, it was particularly high in the eastern districts of the Bengal Presidency in the early 19th century, indicating that the areas where the *Dayabhaga* school of law was practised experienced extremely high number of widow immolations. The author suggests that the ability of a widow to inherit her deceased husband's property under the *Dayabhaga* school may have potentially provided incentives to her deceased husband's other male relatives to kill the widow so that they could inherit his property instead. We, therefore, examine the long run implications of the *Dayabhaga* school on the consumption of female and male assignable goods by the presence of a widow in the household.

Table 10 presents these findings. Panels A and B use data from the 1999-2000 round of the NSS, while Panels C and D use data from the 2004-05 round of the NSS. We present the findings for female assignable goods in Panels A and C and those on male assignable goods in Panels B and D. All districts in present-day West Bengal assume the value 1 indicating that these districts historically followed the *Dayabhaga* school of law (we exclude the northern districts of Darjeeling, Jalpaiguri and Koch Bihar from our sample as before). The alternative columns in Table 10 include varying number of neighbouring districts that lie in the control group for historical legal school, assuming the value of 0 indicating that these districts followed the *Mitakshara* school of law in the past. For instance, column (1) includes all districts of Bihar/Jharkhand and Odisha as control group districts; while column (2) excludes Odisha. Column (3) includes all districts in Bihar/Jharkhand, Odisha and districts in eastern Uttar Pradesh comprising of the region east of the historical kingdom of Oudh that bordered the Bengal Presidency in the past. These include the districts of Siddharthnagar, Maharajganj, Basti, Gorakhpur, Deoria, Mau, Azamgah, Jaunpur, Ballia, Ghazipur, Varanasi, Mirzapur, Sonbhadra, Chandauli as of 1999-2000 round of the NSS and which additionally include the districts that were formed by the bifurcations of the above districts as of 2004-2005 of the NSS; such as Sant Ravidas Nagar/Bhadohi (from Varanasi district), Kushinagar/Padrauna (from Deoria district) and Sant Kabir Nagar (from Basti district). Column (4) includes the districts of Bihar/Jharkhand and those in eastern Uttar Pradesh, excluding the districts in Odisha from the control group. Our regression specification is similar to column (1) of Table 9. Importantly, we can no longer include state fixed effects as we do not have variation in historical legal system across districts within a state. Our identification is achieved by comparing households with and without any

Table 10: Associations of Widowhood, Consumption of Private Assignable Goods with Historical Legal Systems

Year: 1999-2000	(1)	(2)	(3)	(4)
Panel A: Female Assignable Clothing:				
HH has widow	-3.79***	-3.87***	-3.63***	-3.51***
	(0.54)	(0.66)	(0.50)	(0.59)
Dayabhaga School	7.84***	9.36***	8.27***	9.46***
	(0.66)	(0.64)	(0.66)	(0.64)
HH has widow × Dayabhaga School	-4.02***	-3.99***	-4.41***	-4.68***
	(0.93)	(0.98)	(0.91)	(0.96)
R^2	0.199	0.198	0.178	0.173
Observations	18,145	13,995	20,993	16,843
Panel B: Male Assignable Clothing:				
HH has widow	0.82***	0.67**	0.46*	0.18
	(0.26)	(0.33)	(0.25)	(0.31)
Dayabhaga School	0.42***	0.41**	0.60***	0.66***
	(0.16)	(0.18)	(0.16)	(0.17)
HH has widow × Dayabhaga School	0.90	1.12	1.21*	1.54**
	(0.73)	(0.76)	(0.72)	(0.75)
R^2	0.050	0.054	0.048	0.052
Observations	17,966	13,891	20,738	16,663
Year: 2004-2005	(1)	(2)	(3)	(4)
Panel C: Female Assignable Clothing:				
HH has widow	-5.38***	-6.00***	-5.06***	-5.43***
	(0.54)	(0.67)	(0.48)	(0.57)
Dayabhaga School	1.99***	2.25***	3.35***	3.92***
	(0.60)	(0.58)	(0.56)	(0.55)
HH has widow × Dayabhaga School	-1.68*	-0.96	-2.05**	-1.54*
	(0.90)	(0.96)	(0.88)	(0.92)
R^2	0.278	0.320	0.269	0.306
Observations	20,145	15,387	22,951	18,193
Panel D: Male Assignable Clothing:				
HH has widow	-0.08	-0.31	-0.28	-0.62***
	(0.19)	(0.26)	(0.18)	(0.22)
Dayabhaga School	-0.51***	-0.70***	-0.07	-0.05
	(0.13)	(0.15)	(0.13)	(0.14)
HH has widow × Dayabhaga School	1.04***	1.28***	1.19***	1.53***
	(0.30)	(0.34)	(0.29)	(0.32)
R^2	0.070	0.075	0.062	0.066
Observations	19,699	15,032	22,430	17,763

Note: Data source is 1999-2000 and 2004-05 rounds of the NSS Consumption Expenditure Survey. Robust standard errors reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance respectively. Column (1) includes all districts of West Bengal (except Darjeeling, Koch Bihar and Jalpaiguri), Bihar and Odisha; Column (2) includes only West Bengal and Bihar; Column (3) includes West Bengal, Bihar, Odisha and districts in eastern Uttar Pradesh; Column (4) includes West Bengal, Bihar and districts in eastern Uttar Pradesh. The eastern districts of Uttar Pradesh include Siddharthnagar, Maharajganj, Basti, Gorakhpur, Deoria, Mau, Azamgarh, Jaunpur, Ballia, Ghazipur, Varanasi, Mirzapur, Sonbhadra, Chandauli in 1999-2000 round data. In the 2004-05, we additionally include districts that were created by bifurcations of the 1999-2000 districts and include Sant Ravidas Nagar/Bhadohi (from Varanasi), Kushinagar/Padrauna (from Deoria), Sant Kabir Nagar (from Basti). Controls are as in Column (2) of Table 3 excluding dummy for southern zone.

widowed woman across neighbouring districts with differing historical legal schools, but which potentially shared otherwise identical cultural and historical administrative institutions.

We find that spending on female assignable goods is lower in households with at least

one widow in both the 1999-2000 and 2004-05 rounds of the NSS surveys in our estimation samples. However, the spending on female assignable goods is higher in districts that followed the *Dayabhaga* school of law in the past (Panels A and C of Table 10). This finding is similar to Sekhri (2019), where abolition of the custom of widow burnings in 1829 resulted in long term improvement in female literacy rates and therefore women's welfare in the *Dayabhaga* following regions. However, our coefficient of interest is the intersection of the dummy of whether the household has at least one widow and whether the household is located in a district that followed the *Dayabhaga* school of law in the past. We find more or less across all columns in Panels A and C of Table 10 that households with at least one widow have lower spending on female assignable goods relative to households with no widowed women and this gap is larger in districts that followed the *Dayabhaga* school of law in the past. The difference between households with at least one widow and those without any widowed women in terms of monthly spending on female assignable clothing per adult women between the *Dayabhaga* and the *Mitakshara* following regions is close to Rs. 5 from the 1999-2000 round and around Rs. 1.5 from the 2004-05 round of the NSS (Columns (4) of Panels A and C). The monthly average spending on female assignable clothing per adult female lies between Rs. 20 and Rs. 25 for 1999-2000 and between Rs. 22 and Rs. 28 for 2004-05 rounds depending on whether the household has at least one widowed woman (lower mean values for households with a widow) from Table 1. This roughly translates to a lower spending of close to 20% for 1999-2000 and 6% for households with a widowed woman in the historically *Dayabhaga* regions. However, we do not obtain analogous finding for spending on male assignable goods. Spending on male assignable clothing per adult man appears to be uncorrelated or slightly higher in households with at least a widowed woman in the historically *Dayabhaga* following regions (Panels B and D of Table 10.

The above findings show us that historically *Dayabhaga* following regions, where widow burnings was also widespread are areas where women appear to be at a disadvantage relative to men in terms of spending on private assignable goods when widowed women are present in households. Now, Sekhri (2019) notes that the reason that Bengal adopted the *Dayabhaga* school instead of the *Mitakshara* school of law in the past is on account of difference in interpretation of the Hindu religious scriptures in matters of inheritance by *Jumitavahana*, an eminent jurist who served in the court of the Sena king, *Vijaysena* in the 12th century. As kings or citizens had little influence in matters of interpretation of the religious texts and laws, the adoption of the *Dayabhaga* school of law in matters of inheritance in Bengal under the Senas is unlikely to be on account of underlying cultural differences relatively favouring women or widows in Bengal relative to the neighbouring regions. Therefore, the adoption of the *Dayabhaga* school in Bengal under the Senas is potentially likely to be

exogenous to inherent unobserved differences between Bengal and its neighbouring regions [23]. Nevertheless, instead of focusing on the differential roles of the *Dayabhaga* and *Mitakshara* schools in influencing the spending on private assignable goods between households with and without any widowed women, we study whether being under *Sena* rule in the past had a differential influence on these outcomes by the presence of widowed women in the household. This exercise can potentially strengthen our findings from Table 10 further.

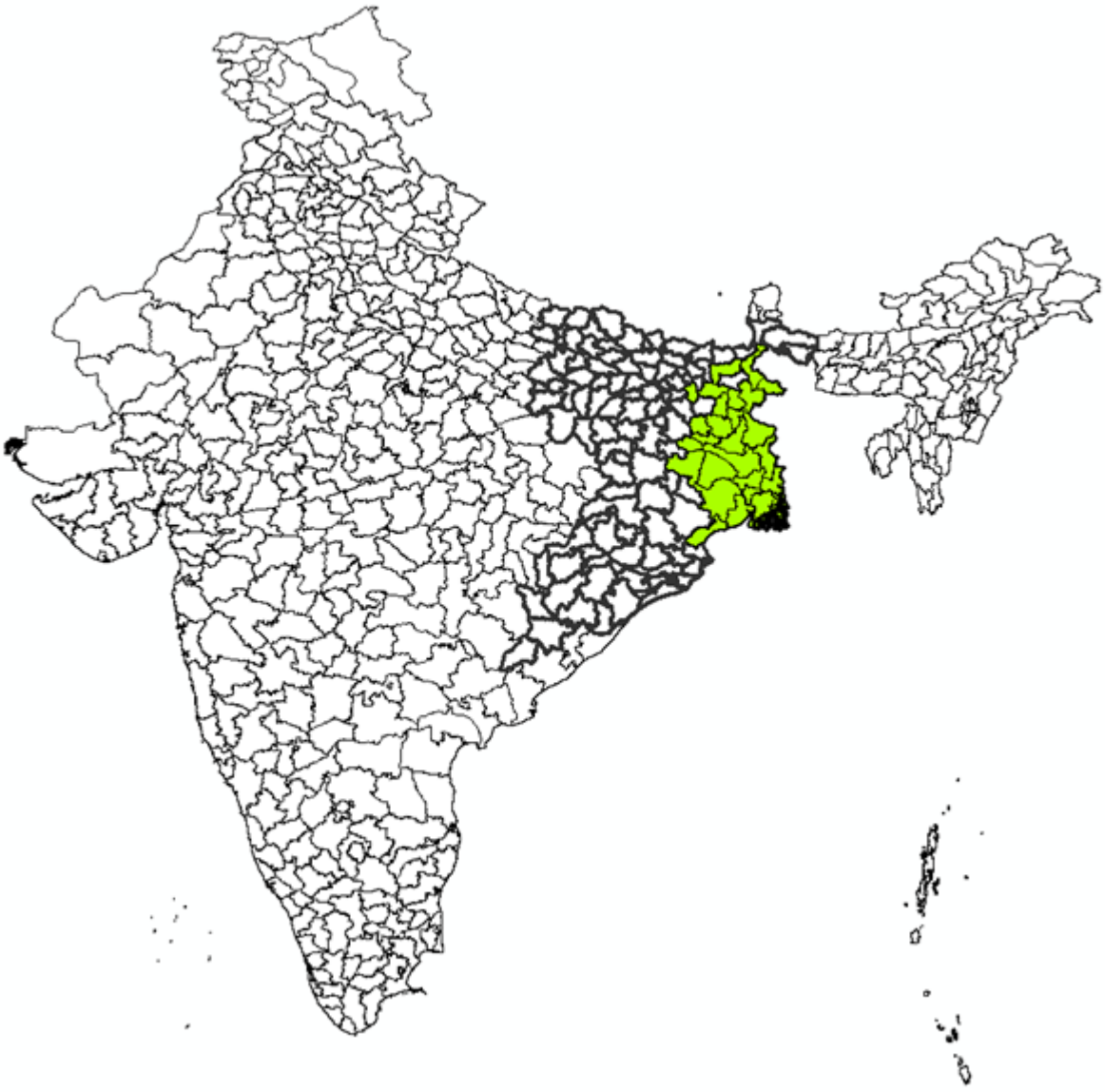

Figure 3: Historic Sena Kingdom Territory following Sekhri (2019)

Figure 3 in Sekhri (2019) provides some indication of what constituted the *Sena* kingdom

[23] See Sekhri (2019) for a detailed discussion of the background of the emergence of differences in the two legal schools in matters of inheritance during the 12th century.

territories in the 12th century. These roughly correspond to the districts of West Dinajpur, Maldah, Murshidabad, Barddhaman, Bankura, Birbhum, Howrah, Hooghly, Nadia, North and South 24 Parganas, Medinipur in present-day West Bengal, parts of Balasore in present-day Odisha and Manbhum (that is, Dhanbad and Purulia), Purnea, parts of Bhagalpur, Santal Parganas, small part of Munger in present-day Bihar/Jharkhand. We compare the difference in the spending on female and male assignable goods between households with and without any widowed women between regions that were historically under the Sena rule and those regions that comprised their immediate neighbours (Figure 3 depicts the rough expanse of the *Sena* kingdom territories in green and bold contours represent neighbouring districts outside the *Sena* kingdom used for comparison in our estimation sample).

Table 11 reports these findings. Modern districts and their subsequent bifurcations that were under the *Sena* rule in the past are coded as 1, while neighbouring modern districts that were not governed by the Senas are coded as 0. We use alternative definitions of what constituted the *Sena* kingdom territories in the past to allay concerns about measurement error in the territorial limits of the *Sena* kingdom. For example, in Column (1) in Table 11, *Sena* kingdom territories comprise the whole of the present-day state of West Bengal (excluding the northern districts of Darjeeling, Jalpaiguri and Koch Bihar), the districts of Bihar/Jharkhand that originated from the erstwhile districts of Purnea (that is, Purnea, Katihar, Araria, Kishanganj for 1999-2000), Bhagalpur (that is, Bhagalpur, Saharsa, Madhepura for 1999-2000; additionally Banka for 2004-05), Munger (that is, Begusarai, Khagaria, Munger in 1999-2000; additionally Jamui, Lakhisarai and Sheikhpura for 2004-05), Manbhum (that is, Dhanbad in 1999-2000; additionally Bokaro for 2004-05)[24], Santal Parganas (that is, Godda, Sahibganj, Dumka, Deoghar in 1999-2000; additionally Pakur for 2004-05) and the districts of Odisha that originated from the erstwhile district of Balasore (includes Bhadrak as well for 2004-05). The non-Sena ruled neighbouring districts include all other districts of Bihar/Jharkhand and Odisha. Column (2) includes the same set of districts as in Column (1) under *Sena* and non-Sena ruled territories. However, additionally, it includes the districts of present-day eastern Uttar Pradesh in the set of neighbouring non-Sena ruled territories (these include Siddharthnagar, Maharajganj, Basti, Gorakhpur, Deoria, Mau, Azamgarh, Jaunpur, Ballia, Ghazipur, Varanasi, Mirzapur, Sonbhadra, Chandauli in 1999-2000; additional districts that were due to bifurcations of these districts in the 2004-05 data are specified while describing sample restrictions for Table 10 above). Column (3) includes the set of districts as in Column (1) in the sample, but excludes the districts from the erstwhile Munger in Bihar/Jharkhand from the set of districts that were historically ruled by the Senas

[24]The erstwhile district of Manbhum was bifurcated to form the districts of Dhanbad in Bihar and eventually Jharkhand and Purulia that lies in the state of West Bengal.

Table 11: Associations of Widowhood, Consumption of Private Assignable Goods with Historical Governance Structures

Year: 1999-2000	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Female Assignable Clothing:						
HH has widow	-3.92***	-3.70***	-3.98***	-3.76***	-4.16***	-3.65***
	(0.58)	(0.54)	(0.57)	(0.53)	(0.72)	(0.64)
Sena Ruled	4.99***	5.37***	5.11***	5.57***	6.65***	6.72***
	(0.52)	(0.52)	(0.55)	(0.55)	(0.54)	(0.53)
HH has widow × Sena Ruled	-2.34***	-2.72***	-2.50***	-2.89***	-2.42**	-3.18***
	(0.85)	(0.82)	(0.86)	(0.84)	(0.94)	(0.89)
R^2	0.193	0.172	0.193	0.173	0.191	0.166
Observations	18,145	20,993	18,145	20,993	13,995	16,843
Panel B: Male Assignable Clothing:						
HH has widow	1.02***	0.58**	0.99***	0.56**	0.94**	0.30
	(0.27)	(0.27)	(0.27)	(0.26)	(0.37)	(0.34)
Sena Ruled	0.48***	0.71***	0.40***	0.62***	0.38**	0.70***
	(0.14)	(0.13)	(0.14)	(0.14)	(0.17)	(0.16)
HH has widow × Sena Ruled	0.27	0.65	0.37	0.73	0.48	1.04
	(0.63)	(0.62)	(0.66)	(0.65)	(0.70)	(0.68)
R^2	0.050	0.048	0.050	0.048	0.054	0.052
Observations	17,966	20,738	17,966	20,738	13,891	16,663
Year: 2004-2005	(1)	(2)	(3)	(4)	(5)	(6)
Panel C: Female Assignable Clothing:						
HH has widow	-5.01***	-5.06***	-5.10***	-4.78***	-5.62***	-4.99***
	(0.58)	(0.48)	(0.59)	(0.51)	(0.71)	(0.59)
Sena Ruled	2.69***	3.35***	1.99***	3.59***	3.44***	5.25***
	(0.50)	(0.56)	(0.52)	(0.47)	(0.53)	(0.48)
HH has widow × Sena Ruled	-1.93***	-2.05**	-1.80**	-2.20***	-1.44	-2.13**
	(0.80)	(0.88)	(0.81)	(0.78)	(0.91)	(0.85)
R^2	0.279	0.269	0.279	0.270	0.322	0.308
Observations	20,145	22,951	20,145	22,951	15,387	18,193
Panel D: Male Assignable Clothing:						
HH has widow	-0.08	-0.26	-0.14	-0.35*	-0.33	-0.66**
	(0.20)	(0.18)	(0.20)	(0.18)	(0.29)	(0.24)
Sena Ruled	0.21*	-0.07	0.11	0.69***	0.14	0.95***
	(0.12)	(0.13)	(0.12)	(0.12)	(0.15)	(0.14)
HH has widow × Sena Ruled	0.68**	1.19***	0.82***	0.96***	0.95***	1.19***
	(0.28)	(0.29)	(0.28)	(0.28)	(0.36)	(0.32)
R^2	0.070	0.062	0.070	0.064	0.074	0.070
Observations	19,699	22,430	19,699	22,430	15,032	17,763

Note: Data source is 1999-2000 and 2004-05 rounds of the NSS Consumption Expenditure Survey. Robust standard errors reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance respectively. Controls are as in Column (2) of Table 3 excluding dummy for southern zone. Different columns cover alternative definitions of territories ruled by the Sena dynasty. Please see the text for more details.

and includes them under non-Sena ruled neighbouring territories. The rationale behind this is only a small part of the erstwhile Munger district appears to be governed by the Senas in the past and so the influence of the Senas is likely to be lower in these regions. Column (4) includes the same set of districts in the sample as in Column (3) and additionally includes the districts in modern eastern Uttar Pradesh as in Column (2) as additional districts in the set of non-Sena ruled neighbouring districts. In Columns (5) and (6) we drop all districts in the state of Odisha from our sample of analysis completely. Otherwise, the set of districts

included in Column (5) is analogous to Column (3) and those in Column (6) is analogous to that included in Column (4), thereby maintaining identical classification of districts as being under Sena and non-Sena rule in the past as Columns (3) and (4). Our regression specification is similar to Column (1) of Table 9. Once again, we are unable to include state fixed effects in our analysis as there is little or no variation in terms of districts within a state that were under the *Sena* rule in the past. Our identification is achieved by comparing the difference between households without and with a widowed woman across neighbouring districts with different historical governance structures but with otherwise potentially similar institutional backgrounds.

Panels A and C in Table 11 report the findings on spending on female assignable goods using the 1999-2000 and 2004-05 rounds data respectively. We find that overall monthly expenditure on female assignable goods is lower in households with at least one widow from both rounds of the data, conditional on the controls. Further, spending on female assignable goods is higher in districts that were historically under the *Sena* rule. In general, as *Sena* rule is also associated with the *Dayabhaga* school of law with a relatively gender egalitarian right of inheritance (at least for widowed women with no male heirs), which has been shown to result in better outcomes for women in the long-run (Sekhri (2019); Table 10), this finding from Table 11 holds similar implications. Now, we are interested in the coefficient of the interaction of the whether the household has at least a widow and whether the district in which the household is located was historically under the *Sena* rule. We find that the coefficient on the interaction term is negative and, by and large, statistically significant. This implies that households with a widowed woman spend less on female assignable goods relative to those with no widows and this gap is larger for households in districts that were under the *Sena* rule in the past. In general, households with at least a widow in *Sena* governed regions in the past are found to spend around Rs.3 and Rs. 2 less per month on female assignable clothing per adult female from the 1999-2000 and the 2004-05 rounds respectively (Column (6) of Table 11). This corresponds to a decline of around 14% (for 1999-2000) and 8.5% (for 2004-05) relative to the means of the outcome variable.

We also examine the implications on spending on male assignable goods in Panels B and D using the 1999-2000 and 2004-05 rounds of the data respectively. The findings on spending on male assignable goods are different from what we found for female assignable goods. Focusing on the interaction coefficient on whether the household has at least a widow and whether the district in which the household is located was historically under the *Sena* rule, we find that either there is no differential effect on monthly spending on male assignable clothing per adult man by the presence of a widow in the household across historically *Sena* and non-Sena governed neighboring areas (Panel B) or the gap in expenditure on male

assignable clothing is smaller between households with and without a widowed woman in historically *Sena* governed areas relative to their immediate neighbouring regions outside the territorial limits of the *Sena* kingdom. Therefore, the findings from Table 11 are similar in spirit to those found in Table 10.

Therefore, we continue to find a relative disadvantage for women when widows are present in a household in areas historically following the *Dayabhaga* school of law or governed by the *Senas*; although there seems to be no overall relative disadvantage for women in terms of household spending on private assignable goods in these areas. Persistence in historical cultural institutions against widows could potentially play some role in explaining continued relative disadvantage of widows within Indian households.

6 Conclusion

This paper has studied how the consumption of female assignable goods varies by the presence of widows in Indian households. We find that households with widows have lower consumption of female assignable goods and our results appear to be robust to inclusion of various controls, state and even district fixed effects. Further, selection into widowhood is plausibly random and overall household poverty on account of death of a male earning member does not appear to be the likely explanation of why households with a widow have lower spending on female assignable goods. Importantly, we do not find that spending on male assignable goods is lower in households with at least one widow. Also, the gap in spending on female assignable goods between households with and without widows is the highest among households that belong to the top of the income distribution. Further, widowhood appears to have a negative effect on women's well-being within households that is distinct from the effect of older age which has been shown to contribute to a decline in women's bargaining power within the household.

We then examine the impact of rainfall shocks on the consumption of female assignable goods for households with a widowed woman relative to households without any widowed women. We find that although beneficial rainfall shocks increase overall spending on female assignable goods; the improvement in spending on female assignable goods per adult woman is lower in households with a widow. Relative to the mean, a beneficial rainfall shock increases monthly spending on female assignable goods per adult woman by nearly 3% more in households without any widow relative to those with at least one widowed woman. We obtain opposite findings for spending on male assignable goods. The findings show that a positive income shock like a favourable rainfall shock can only improve women's access to consumption resources within the household by a smaller magnitude in the presence of

widows. We find that possible persistence in historical cultural norms around the treatment of widows can potentially explain why beneficial environmental shocks that improve overall household income may attenuate the improvement in women's access to consumption within the household on account of presence of widows.

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Appendix Tables

Table A.1: Difference Between Currently Married and Widowed Women Aged 19-49 Years

Variable	Currently Married (1)	Widowed Women (2)	Difference (1) - (2)
Panel A: 1999-2000			
Age (years)	30.91 (0.03)	39.10 (0.13)	-8.20*** (0.14)
Height (cm)			
19-25 years	152.33 (0.02)	152.75 (0.23)	-0.42* (0.23)
26-30 years	152.34 (0.02)	152.50 (0.19)	-0.16 (0.19)
31-35 years	152.35 (0.03)	152.38 (0.15)	-0.03 (0.15)
36-40 years	152.37 (0.03)	152.09 (0.12)	0.28** (0.13)
41-45 years	152.33 (0.03)	152.11 (0.11)	0.22* (0.11)
46-49 years	152.28 (0.05)	152.05 (0.12)	0.23* (0.13)
Childhood place of residence: Rural	0.78 (0.001)	0.79 (0.01)	-0.01 (0.01)
Proportion with no education	0.52 (0.002)	0.66 (0.01)	-0.14*** (0.01)
Observations	66,830	2,962	
Panel B: 2005-2006			
Age (years)	31.86 (0.03)	39.15 (0.13)	-7.29*** (0.13)
Height (cm)			
19-25 years	152.41 (0.02)	152.18 (0.27)	0.24 (0.27)
26-30 years	152.43 (0.02)	152.33 (0.18)	0.10 (0.18)
31-35 years	152.47 (0.03)	152.22 (0.14)	0.25* (0.15)
36-40 years	152.46 (0.03)	152.51 (0.11)	-0.05 (0.11)
41-45 years	152.42 (0.03)	152.23 (0.10)	0.19* (0.11)
46-49 years	152.35 (0.04)	152.34 (0.13)	0.005 (0.14)
Proportion with no education	0.42 (0.002)	0.56 (0.01)	-0.15*** (0.01)
Observations	67,181	3,014	

Note: Data source is Demographic and Health Surveys (DHS) for India. Difference of means (or proportions for binary outcomes - childhood place of residence and if has no education) are reported by 5 year age cohorts of ever married women at the time of the survey. Standard errors are in the parentheses. ***, **, * indicate statistical significance at the 1%, 5% and 10% level of significance respectively. Height and age at first marriage are limited to observations that fall within the 25th and 75th percentiles of the distributions of these variables for women aged 19 years or older at the time of the survey.

Table A.2: Outcome is Monthly Expenditure on Women's Clothing Per Adult Female With Alternative Fixed Effects and Sample Restrictions

Year:	1993-94	1999-00	2004-05	2009-10	2011-12
Panel A: Including District Fixed Effects					
HH has widow		-6.12***	-6.01***	-9.72***	-13.57***
		(0.33)	(0.27)	(0.46)	(0.66)
All Controls		✓	✓	✓	✓
District Fixed Effects		✓	✓	✓	✓
R-squared		0.19	0.22	0.18	0.30
Observations		82,751	92,567	74,648	74,933
Panel B: Only > 0 spending on female clothing					
HH has widow	-5.52***	-7.20***	-7.02***	-11.38***	-15.04***
	(0.34)	(0.38)	(0.30)	(0.53)	(0.70)
All Controls	✓	✓	✓	✓	✓
State Fixed Effects	✓	✓	✓	✓	✓
R-squared	0.23	0.15	0.17	0.14	0.28
Observations	70,902	70,112	77,695	63,129	66,806
Panel C: Drop Top 0.5% spending on female clothing					
HH has widow	-3.69***	-5.05***	-5.20***	-7.05***	-11.90***
	(0.18)	(0.21)	(0.21)	(0.38)	(0.55)
All Controls	✓	✓	✓	✓	✓
State Fixed Effects	✓	✓	✓	✓	✓
R-squared	0.22	0.22	0.24	0.23	0.28
Observations	87,832	81,938	91,873	73,900	74,273

Note: Robust standard errors are reported in parentheses. ***, **, * refers to statistical significance at the 1%, 5% and 10% level of significance respectively. The omitted category is household with no widow. For all other details, please see table notes of Table 3.

Table A.3: Impacts of Rainfall Shocks on Monthly Expenditure on Women's (Men's) Clothing Per adult Female (Male) by Presence of Widow - Alternative Specifications

	(1)	(2)	(3)
	> 0 Spending on Assignable Good Only	All-India CPI as Deflator	> 0 Spending on Assignable Good & All-India CPI as Deflator
Panel A: Female Assignable Goods			
HH has widow	-4.01***	-3.25***	-3.82***
	(0.12)	(0.11)	(0.11)
Rainfall Shock	0.46*	0.004	0.38
	(0.26)	(0.23)	(0.24)
HH has widow × Rainfall Shock	-0.30	-0.46**	-0.30
	(0.20)	(0.18)	(0.19)
R^2	0.14	0.17	0.14
Observations	211,086	248,165	211,086
Panel B: Female Assignable Goods			
HH has widow	-4.02***	-3.26***	-3.84***
	(0.12)	(0.11)	(0.12)
Standardized Yearly Rainfall	0.18	-0.14	0.11
	(0.19)	(0.18)	(0.17)
HH has widow × Standardized Yearly Rainfall	-0.29**	-0.35***	-0.30**
	(0.14)	(0.13)	(0.14)
R^2	0.14	0.17	0.14
Observations	211,086	248,165	211,086
Panel C: Male Assignable Goods			
HH has widow	1.01***	0.40***	0.97***
	(0.10)	(0.08)	(0.09)
Rainfall Shock	0.15	-0.002	0.15
	(0.13)	(0.10)	(0.12)
HH has widow × Rainfall Shock	0.20*	0.21***	0.23**
	(0.10)	(0.08)	(0.10)
R^2	0.18	0.21	0.19
Observations	182,423	239,328	182,423
Panel D : Male Assignable Goods			
HH has widow	1.03***	0.41***	0.99***
	(0.09)	(0.08)	(0.09)
Standardized Yearly Rainfall	-0.08	-0.13	-0.09
	(0.10)	(0.09)	(0.10)
HH has widow × Standardized Yearly Rainfall	0.25***	0.21***	0.26***
	(0.07)	(0.06)	(0.07)
R^2	0.18	0.21	0.19
Observations	182,423	239,328	182,423
All Controls	✓	✓	✓
District Fixed Effects	✓	✓	✓
Year Fixed Effects	✓	✓	✓

Note: Data source is pooled NSS Consumption Expenditure Surveys 1993-94, 1999-2000, 2004-05, 2009-10, 2011-12. Robust standard errors clustered at the district level are reported in parentheses. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance respectively. All other Controls are as in Column (2) of Table 3. "Rainfall Shock" is a discrete variable that assumes the value 1 if the annual rainfall is above the eightieth percentile for that district,0 if it is between eightieth and twentieth percentile, or -1 if it is below the twentieth percentile. "Standardized Yearly Rainfall" is a continuous variable and is calculated by subtracting long-term average rainfall in a district (1971–2014) from actual rainfall in a given year and dividing it by standard deviation of rainfall in that district. All nominal expenditure figures have been deflated by state specific Consumer Price Index for Agricultural Laborers (CPI-AL) in order to convert them into real terms in Column (1) and by all-India CPI in Columns (2) and (3). Columns (1) and (3) limit the sample to households with positive expenditure on assignable good.