



Productive aging in India

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ABSTRACT

With its sociocultural, institutional, and demographic contexts, India offers a unique opportunity to study the dynamics and experiences of aging, especially as it is poised to have a large increase in the number of persons aged 60 and above in the next half a century. In this paper, we focus on the concept of productive aging that emphasizes the active participation of older persons in society. We examine the correlates of productive aging in India, drawing on data from the Building Knowledge Base on Population Aging (BKPAI) survey of 9852 men and women aged 60 years and above in seven states of India in 2011. The productive activities that we examine pertain to four domains: work, contribution to household financial matters, grandparenting, and social engagement. The findings highlight the importance of gender, family structure, and socio-economic status in these different aspects of productive aging. Importantly, the findings show that the effect of the correlates is not the same across the different measures of productive aging. We find that women are less likely than men to engage in all productive activities except for grandparenting, and that living with children and adverse health reduce the likelihood of current employment or financial contributions, but not of social engagement or grandparenting. Greater wealth at older ages reduces the likelihood of employment but increases the likelihood of social engagement and ties. The study contributes to the understanding of opportunities and constraints of productive aging in India and has implications for intergenerational relationships, support and dependencies in old age.

1. Introduction

The significance of aging in India goes beyond the number of older people. The numbers are large though—13% of older people in the world, or about 110 million of them, live in India (United Nations, 2015). The proportion of older people in India is projected to increase to 20% from the current 8% by 2050 (United Nations, 2015). The numbers, however, are not unusual given the size of the Indian population. In a comparative perspective, India's population is still considered young, though there is spatial diversity, with fertility, a key contributor for aging, declining only gradually at the national level (Guilmoto and Rajan, 2013).

The importance of aging in India for a socio-demographic study is its potential to offer different perspectives on the experience of aging and contribute to better theorizing about old age. These perspectives on aging in India are shaped by the particular influences of the family and kinship systems, moral and religious influences, state and social provisions, and the nature of civil society. Also, the socio-economic context of aging in India has rapidly changed over the last quarter century—primarily led by economic changes since the liberalization of the Indian economy, agrarian changes, internal migration and social

development. Such changes could potentially disrupt the traditional sources of support and reshape the aging experience. This paper on productive aging in India is set in the demographic context of changing age structural composition and socio-economic context of changing support structures and dependency at old ages.

2. Productive aging: concept, critique and application

Productive aging is a concept that implies productivity with an emphasis on older persons as assets and not a burden (Morrow-Howell and Greenfield, 2010). However, there is no consensus on the type of activities that could be considered as productive. Instead, a wide-range of activities from production of goods and services (paid and unpaid), volunteering (formal and informal), caregiving, and those activities that develop the *capacity* for work have been considered as contributing to productive forms of aging (Sherraden et al., 2001; Morrow-Howell and Wang, 2013). These varied forms of productive activities are seen as contributing to higher quality of life and life satisfaction and better health (Rowe and Kahn, 1998; Powell, 2005).

The notion of productive and successful aging has not been without its critique. A systematic review of the literature by Martinson and

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Berridge (2015) highlights the lack of emphasis on socio-structural contexts of aging and how they may further or impede productivity in old age. A second critique is the association of productivity with ability and the consequent devaluation of any form of disability. Aging from the perspective of productivity is seen as a dichotomized outcome of either being productive or not being productive. Although the definition of productivity has included a wide range of activities, Martinson and Berridge (2015) note that the typical and commonly used definitions tend to devalue relational work. As such work is often done by older women, the exclusion of these activities suggests limitations in forming a better understanding of gender and aging.

Another important critique of productive aging is that it lacks cultural breadth (apart from western societies) and subjective meanings associated with aging (Martinson and Berridge, 2015). Studies from India, among other non-western societies, have contributed to this critique. Such studies have questioned the assumption that productivity at older ages is the normative ideal and valued. Research by Lamb (2011; 2013) in India, for instance, draws our attention to the moral-cultural values, norms and ideals of old age that see human transience, decline, debility and dependence in old age as normal processes of aging and not as failure to age well. The norms of dependence and interdependence in old age and the expectation of support have meant that families remain the key sources of support for older persons in India, even as the ways of support and extent of support are changing (Brijnath, 2012; Kalavar and Jamuna, 2011). Such inter-dependencies have been reinforced by the limited nature of social welfare in India. For older persons, state policies have emphasized family support and have effectively placed the responsibility of caring for older persons on families (Navaneetham and Dharmalingam, 2012).

This study is situated in a context where productivity in old age is not normatively idealized. By taking productivity as the point of analyses, the study investigates the role of gender, socio-economic status, family structure and other correlates on some aspects of productive aging. We study indicators pertaining to four domains of productive aging: employment, financial contribution, caregiving, and social engagement and ties. The context, relevance and importance of the indicators are described next along with mapping of the indicators to the health, economic and social frames drawing from Ozanne (2010). The operationalization of these measures is presented in the Data and Methods section.

Employment and financial independence: Employment and financial independence of older persons are seen as important in maintaining health, social roles, networks and social integration, and also contribute to national economic growth (Ozanne, 2010). In India, however, the main reason for older persons to work is due to economic and other compulsions rather than out of choice (UNFPA, 2012). This confirms with studies that suggest that employment in older ages in India is largely determined by the economic situation and health status of older persons rather than by a fixed age of retirement (Dharmalingam, 1994; Mathew and Rajan, 2008). The economic dependence of older people in India can be seen from the fact that a third of older people are financially fully dependent on others, and as many as 18 million older people live below the poverty line (Srivastava and Mohanty, 2012).

There are also structural reasons for older people continuing to work in India. An overwhelming majority (about 85%) of the Indian labor force works in the informal sector, and so do the majority of older workers who are employed in agriculture and service sectors (Naik, 2009; Reddy, 2016). Those working in the informal sector do not have an official retirement age or entitlement to pension. This means that most people in India enter old age with insufficient provisions for financial support (Alam and Barrientos, 2010). India also lacks social welfare provisions for older people and the current provision of financial support for older people remains inadequate (Dommaraju, 2016). Therefore, while financial dependence on the family and kin is common, employment at older ages remains crucial for continuing economic contributions to the family, as well as retaining some

financial independence.

Caring for grandchildren: The most common role for Asian grandparents is in providing care for grandchildren (Mehta and Thang, 2012). In India, too, providing care for grandchildren is an important role for older persons, especially as the majority of older people live in multigenerational households (Lamb, 2014). As Arber and Timonen (2012) note, the nature and importance of grandparenting is directly related to the structure of the family systems and is intense in closely tied family systems such as in India. There are strong social and cultural expectations of grandparents to care for grandchildren, and these are structured within the broader norms of intergenerational obligations and expectations. Living in multigenerational households with grandchildren present also promotes better health for older people through greater support and interactions with children and grandchildren (Samanta et al., 2015). Grandparenting, as with employment and financial independence, is gendered with grandmothers playing a greater role in informal care (Morgan, 2011).

Social engagement and social ties: Engagement in social activities is considered a key component of productive and active aging. This is because participation in social activities promotes better health status, psychological well-being and life satisfaction. Social activities help to build social capital, promote social engagement and socialization, and enhance social integration and self-worth (Ozanne, 2010; Tang, 2012). The different aspects of participation in social activities indicate the embeddedness and connections older people have with the communities they live in and are considered as key aspects of aging in India (Vatuk, 1990, 1996).

3. Data and methods

We use data from the Building Knowledge Base on Population Aging in India (BKPAI), 2011 study conducted by UNFPA, India in collaboration with the Institute for Social and Economic Change, Bangalore and the Institute of Economic Growth, Delhi. BKPAI is a cross-sectional dataset of 8329 households across seven states of India – Himachal Pradesh and Punjab in the north, West Bengal and Odhisha in the east, Maharashtra in west-central India, and Kerala and Tamil Nadu in the south – selected on the basis of regional representation as well as their relatively more advanced stage of demographic transition and higher proportion of older people in the population compared to the Indian average (for more details, see UNFPA, 2012). The study conducted interviews with 9852 men and women aged 60 years and over to collect wide-ranging information on living arrangements, employment history, social activities and networks, as well as consumption expenditure and morbidity.

We limit our study to respondents who are ever-married and have at least one child, because we are interested in the effects of living arrangements and marital status and in maintaining a consistent comparison across our measures of productive aging which involve interactions with family members via contributions to family financial matters, visiting friends and relatives, and grandparenting. In the BKPAI, fewer than 1% (86 cases) of the total sample reported that they had never married. Marital status information was missing from the data for an additional 6 cases. The sample was thus initially limited to 9760 cases. The study only asked ever-married respondents about children. 276 respondents had no children, and 12 cases had missing data on the number of children. An additional 133 cases had missing information on the current residence of children. Although this strongly suggests that these respondents do not have their children living with them, we included only those respondents with who state whether their children live with them or elsewhere, and performed listwise deletion of these cases, yielding an analytical sample of 9339 respondents, about 95% of the total BKPAI sample.

3.1. Dependent variables

We study four domains of productive aging as discussed earlier. These are employment, contribution to household financial matters, grandparenting, and social engagement. The technical description of the measures that are used in the analysis is as follows. We operationalize our first dependent variable of employment as work at any time in the one year preceding the survey. BKPAI defines work as jobs for which individuals are paid in cash or kind, as well as activities such as selling general use items, having a small business, working on a family farm or in a family business, including seasonal work and excluding housework. About 65% of the analytical sample initially reported that they had ever worked in their lives. The study then asked only these respondents about whether they had worked in the one year preceding the survey, thus resulting in a sample of 5924 respondents for our study of employment.

Contribution to household financial matters is measured as involvement by the respondents in the payment of bills and the settlement of financial matters. We note that this is a broad measure of older persons' engagement in financial matters, but it takes into account that the active contribution of older persons in India may go well beyond the everyday management of household finances, and importantly include an active participation in discussion, and advice in the household's financial matters. Although BKPAI did collect information on direct contribution by the respondents towards household expenditure, this was restricted to only about 57% of the total sample that had a current regular income. Limiting the sample for household financial contribution to only those older persons who have a current regular income would yield a highly selective sample, and we choose to instead include all older persons in the analytical sample irrespective of their current work or income status.

Care for grandchildren is measured as respondent's self-reported involvement in taking care of grandchildren. We limit the analysis to 8649 respondents from the sample who report that they have at least one grandchild.

Our final domain of productive engagement, social engagement, is operationalized through three measures. We first consider participation in community or group meetings or participation in public meetings to discuss local, community, or political issues, or in social activity groups once or twice a month or more frequently, or working with neighbors to "fix or improve something" once or twice a year or more frequently. The idea of participating in such community, social activity and group meetings is a key aspect of productive aging, and is meant to suggest that older persons can contribute to society by discussing and influencing actions that can be taken for the good of their social group, neighbourhood and community (Gonzales et al., 2015). At the same time however, the context of India with its strong and persistent social hierarchy along the lines of gender, caste, and class indicates that a number of individuals may be systematically excluded or marginalized from such social engagement and participation, including women, individuals from minority religious groups, disadvantaged caste or tribal groups, and members of so-called 'backward classes'. In our study, we are concerned therefore that measuring social engagement only through the lens of public participation in community or group meetings would underestimate the extent to which older persons are productive, and we consider two other measures as well.

Religious programmes are important sites for older persons to interact with other members within their community, establish new contacts and maintain social ties. Older individuals are more likely than younger persons to be religious and research also suggests that as individuals age, they tend to become more interested and have more time for religious and spiritual pursuits (Moberg, 2005; Zimmer et al., 2016). We therefore consider participation in religious programmes and services as a means of social engagement and our second variable. We consider participation in religious programmes and services as a measure of social engagement if the respondents report that they participate

Table 1

Distribution of dependent and independent variables.

Variables	%
Dependent Variables	
Employment in last 1 year (<i>those who had ever worked</i>)	37.2
Contribution to household financial matters	42.4
Involvement in grand parenting (<i>those with at least 1 grandchild</i>)	56.2
Social Engagement	
Community and group meetings	31.6
Religious programmes and services	18.9
Visiting friends and relatives	20.2
Independent Variables	
Female	52.7
Age	
60–69 years	61.8
70–79 years	27.3
80+	10.9
Marital Status	
Currently married	61.6
Widowed	37.4
Separated/divorced	1.0
Never married	0.1
Living Arrangements	
Living with spouse and child (ren)	43.6
Only with child (ren)	30.2
With spouse alone	15.4
Living alone	5.1
With others	5.8
Residence in Urban Area	26.6
Residence in Rural Area	73.4
Educational Attainment	
Never attended school	51.1
Some primary	20.4
Some secondary	22.5
Some higher	5.9
Social Group	
Higher caste	38.4
Scheduled caste	20.2
Scheduled tribe	5.2
Other backward class	36.2
Religion	
Hindu	78.3
Muslim	8.3
Christian	3.1
Sikh and others	10.3
Chronic Health Condition	20.2
ADL Dependency	7.6
Sample Size	9339

in these once or twice a month or more often.

Our third measure of social engagement pertains to the idea of maintaining non-residential social ties. Social networks outside the household are an important source of support for older persons particularly for individuals who do not cohabit with children, as well as those who experience loneliness or isolation even within a multi-generational living arrangement. We code the variable as 1 if respondents reported that they visited friends or relatives once or twice per month or more, and 0 if they reported a lower frequency of visits. Since the focus of our paper is productive aging, we do not consider as productively engaged those individuals who report infrequent – i.e. once or twice per year – participation in maintaining non-household social ties. This measure is based on the frequency of the activities. The data do not have information to measure intensity of social engagement and ties.

We present the distribution of these dependent variables in our analytical sample in Table 1. A little over a third of individuals who had ever worked in their lives had been employed in the one year preceding the survey. In the entire analytical sample of 9339 older persons, the percentage of those who participate in their household financial

Table 2
Bivariate distribution of productive aging and demographic, socioeconomic, and health factors.

	Employment	Household Financial Matters	Grand parenting	Community/Group Meetings	Religious Programmes	Non-residential social ties
Male	39.0	66.9	50.0	42.1	20.3	22.4
Female	32.2	20.2	61.8	22.0	17.6	18.2
Age						
60–69 years	46.8	49.7	57.4	34.1	19.2	22.1
70–79 years	24.7	34.8	56.5	29.5	19.7	19.1
80+	12.1	20.5	48.2	23.0	14.9	12.7
Marital Status						
Currently married	40.6	54.4	54.5	37.4	20.5	21.7
Widowed	27.6	23.0	58.9	22.0	16.3	17.6
Other	47.1	32.3	59.6	32.6	16.2	28.4
Living Arrangements						
Living alone	42.3	48.7	23.4	16.8	15.7	18.3
With spouse alone	39.8	59.8	28.1	31.3	20.2	21.9
Living with spouse and child (ren)	41.5	52.5	62.9	39.5	20.5	21.7
Only with child (ren)	24.3	19.3	64.9	23.2	16.3	17.3
With others	32.9	36.4	63.3	30.5	19.2	21.3
Place of residence						
Rural	39.8	41.7	56.3	34.1	17.9	19.5
Urban	29.7	44.5	55.7	24.9	21.6	22.2
Educational Attainment						
Never attended school	37.4	30.2	56.7	27.5	15.8	16.2
Some primary	43.1	43.9	60.1	32.0	20.6	22.9
Some secondary	36.9	60.7	52.8	37.1	21.8	24.3
Some higher	22.1	73.6	50.8	45.3	28.6	30.5
Household Wealth Quintile						
Poorest	45.0	35.8	42.9	24.4	11.0	13.5
Poorer	45.1	42.2	54.0	29.6	15.8	19.3
Middle 20%	34.6	44.2	60.8	34.1	20.7	23.4
Richer	26.5	46.2	62.7	32.8	21.5	20.6
Richest	26.2	46.1	65.7	40.9	29.9	27.2
Religion						
Hindu	37.4	42.2	54.0	30.9	16.1	19.5
Muslim	35.2	40.4	68.6	28.8	27.1	23.4
Christian	19.0	48.3	63.9	22.7	50.2	34.5
Sikh and others	43.4	44.5	59.8	42.3	23.7	18.5
Social Group						
Higher caste	35.2	43.1	58.7	37.5	22.1	20.1
Scheduled caste	43.2	42.3	52.9	33.8	14.5	15.8
Scheduled tribe	52.6	35.4	52.8	32.4	7.8	16.5
Other backward class	33.6	42.8	55.8	24.1	19.5	23.3
Chronic Health Condition	23.5	39.7	60.1	30.8	24.6	24.7
ADL Dependence	6.5	12.7	39.9	18.1	11.4	10.0
Sample size	5924	9339	8649	9339	9339	9339

matters is about 42 percent, and more than half of the 8649 respondents with at least one grandchild are actively involved in grandparenting. The proportion of individuals who are socially engaged is lower than the other measures of productive aging. While 32 percent of the individuals attend community or group meetings, about 19 percent attended any religious programmes or services on a regular basis. About one-fifth of the sample reported that they have visited friends or relatives outside their homes.

3.2. Explanatory and control variables

In this study, we seek to establish the socio-demographic and economic correlates of productive aging among older persons in India, in particular gender, living arrangements, marital status, education, wealth, and health status. In our analytical sample, the average age of the respondents is 68.2 years (standard deviation: 7.3 years). We measure marital status at the time of the survey and classify the variable into three categories: two primary categories of currently married combined with those reported living together with a partner, widowed, and a third category which combines separated, or divorced and others.

In terms of living arrangements, we create a variable with five

categories: living alone, living with only a spouse, living with a spouse and children, living with children alone, and living with others. We use the household wealth quintiles provided in the dataset as a measure of wealth, and classify education into four self-reported categories, no formal schooling, some primary (1–5 years of schooling), some secondary (6–10 years), and some higher education (more than 10 years).

For health status, we use self-reported chronic health conditions that the respondents reported have been diagnosed by a doctor or a nurse. The eight health conditions that we consider as a chronic health condition are cerebral embolism/stroke/thrombosis, heart attack, diabetes, chronic lung disease, Alzheimer's disease, injury due to accident, and cancer. In addition, we operationalize limitations in performing activities of daily living (ADL) based on the respondent's report of requiring assistance to do any of the six activities: bathing, dressing, moving in and out of bed or chair, continence, using the toilet, and eating.

We expect that opportunities for older persons to be active and productively engaged will be different in rural areas compared to urban areas due to differences in lifestyles, resources and potentially the extent and frequency of contact with social networks both within and outside the family that individuals have access to. As mentioned earlier,

we expect that religious and social group identities have a significant impact on the extent to which older persons, particularly those from disadvantaged and minority groups, can engage in public spaces and in a wider community. Social group identity is also a determinant of educational opportunities received and the nature of employment that older persons would have pursued in their lives, and therefore affect their lifelong accumulation of resources, both social and economic. We include these factors in the models as controls. Older persons' functional capacity for more active lives is expected to decline with age, and in addition to health status as one of our explanatory variables, we include age as a control in the analysis.

In our multivariate analysis, we employ three-step logistic regression models to study each of the dependent variables which are coded as dichotomous measures. The complete set of these models is shown in [Supplementary Tables S1–S6](#). We start each analysis with demographic variables: gender, age, marital status, and living arrangements. We then add socioeconomic status variables: urban/rural residence, education, wealth, religion, social group. In our final model, we add to the analysis two health variables to see if the relationships seen thus far persist when chronic health conditions and ADL dependencies among older persons are accounted for. All models also include dummy variables for the seven states that the respondents resided in order to account for state-level influences; this implies a state-fixed effects model.

All analysis was done in Stata version 13. Variance inflation factor and condition number (calculated using the `coldiag` command) did not indicate any multicollinearity problems in our multivariate models.

4. Results

4.1. Descriptive statistics

The descriptive statistics of the independent variables in our analysis are presented in [Table 1](#) and the bivariate distribution of these with the productive aging dependent variables in [Table 2](#). About 62% of the sample is in the age group of 60–69 years, and a little over a quarter older at 70–79 years. About 11% of the individuals are aged 80 and over. A little over half the sample is female. About 62% of the respondents are still married, whereas 37% are widowed. The balance categories of never-married and separated/divorced reveal both that marriage in this age group is nearly universal, and that separation or divorce is uncommon or unreported. About 44% of the respondents live with their spouse as well as child (ren), followed by 30% living with children only (without spouse), and about 15% live with their spouse only without children. 5.1% of the respondents live alone, and 5.8% with others. The vast majority of the sample, about 73%, reside in a rural area. As expected for the cohort of those aged 60 and over in 2011, about half of the sample had never attended school. About one-fifth had some primary schooling, another fifth had some secondary schooling, and only 6% had completed secondary schooling and attained 8 or more years of schooling. About 20% had been diagnosed with a chronic health condition, and 8% reported requiring assistance in performing at least one activity of daily living.

In [Table 2](#), we present the bivariate distribution of the productive aging measures with each of the explanatory variables used in the analysis in order to examine to what extent older persons in India are active and economically and socially engaged. We highlight here some of the main aspects of productive aging in India that this table reveals. First, we see that there are gender-based differences in all measures of productive aging that we use. Except for grandparenting, where a greater proportion of women are involved, lower proportions of women than men participate in other aspects of productive activities. The difference is greatest for financial contributions to the family (20% of women compared to 67% of men), narrows to 32% of women compared to 39% of men for employment, and narrows further for two measures of social engagement: participation in religious programmes and in non-residential social ties. In the case of grandparenting, religious

programmes, and non-residential social ties, similar proportions of older persons aged 70–79 are engaged as in the 60–69 age group. In terms of living arrangements, older persons who live alone have the highest proportion being employed, and at the same time, half of them contribute to household financial matters. Older persons living alone are least likely to participate in community meetings and religious programmes whereas those living with a child and a spouse are the most likely. We also note in this bivariate distribution that the absence of a spouse has a greater impact on older persons' social engagement, compared to the absence of a child. Older persons living with a spouse and a child, and those living with a spouse but without a child in the same household are similar in terms of religious engagement and non-residential social ties, albeit with higher participation in community and group meetings. On the other hand, older persons who live with a child only and not a spouse have lower levels of social engagement across all three measures. Widowed respondents are less likely to be productively engaged compared to those currently married, except for grandparenting where they are somewhat more likely to be involved (59% for the widowed compared to 55% among the currently married). Given that older persons' living arrangements are strongly influenced by their marital status, it is of interest to see whether these bivariate relationships are seen to be statistically significant in the multivariate analysis that follows.

We also see that the prevalence of current employment as well as grandparenting among older people rises between those with no school and some primary schooling, and then declines for those with higher education. Wealthier individuals are less likely to be employed, but more likely to contribute financially to their households, be involved in grandparenting, and be socially engaged. Across the two health status measures, we see that even with a chronic health condition, about a quarter of the sample is currently employed, about 40% contribute financially, and between a quarter and third are socially engaged. The presence of ADL difficulties severely limits productive aging across all measures but grandparenting.

4.2. Multivariate results

4.2.1. Employment

[Table 3](#) presents the results of the logistic regression models of current employment, participation in household finances, and grandparenting among older people, and [Table 4](#) presents the results for the three measures of social engagement. [Tables 3 and 4](#) present the final models from the analysis, for brevity and easier comparison across models. The full set of models are presented in the supplementary tables.

In the analysis of employment in [Table 3](#), we see at the outset that women are significantly less likely compared to men to be currently working. Marital status does not have any association with current employment, and we see for living arrangements that only those older persons who live with children are less likely to be employed compared to those living in with both a spouse and a child. Those with some formal schooling are more likely to be employed than those with no education. But those with higher level of education are less likely to be employed than those with no education. We also see a wealth gradient, with wealthier older persons less likely to be employed compared to those in the lowest wealth quintile. In and of itself, poorer health is associated with lower likelihood of employment, with older persons with a chronic condition and those with an activity of daily living dependence significantly less likely to be working compared to those without these health conditions.

4.2.2. Contribution to household finances

The second set of results presented in [Table 3](#) pertain to the contribution of older persons to household financial matters. The results show statistically significant differences in contribution to household financial matters by gender, living arrangements, education, household

Table 3
Results of logistics regression models of productive aging measures of older persons aged 60 + in India, 2011.

	Employment		Household Financial Matters		Grandparenting	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Female (Ref. = Male)	0.70***	(0.57–0.85)	0.11***	(0.09–0.13)	1.61***	(1.40–1.86)
Age (in years)	0.89***	(0.88–0.90)	0.93***	(0.92–0.94)	0.97***	(0.96–0.98)
Marital Status (Ref. = Currently married)						
Widowed	1.39	(0.80–2.41)	1.32	(0.84–2.07)	0.47***	(0.31–0.73)
Other	1.58	(0.83–2.98)	0.91	(0.46–1.79)	0.80	(0.44–1.44)
Living Arrangements (Ref. = Living with spouse and child (ren))						
Living alone	1.17	(0.65–2.11)	3.28***	(1.99–5.39)	0.27***	(0.17–0.44)
With spouse alone	1.22	(1.00–1.51)	1.96***	(1.63–2.36)	0.19***	(0.16–0.23)
Only with child (ren)	0.46**	(0.26–0.82)	0.59*	(0.37–0.95)	1.98**	(1.27–3.08)
With others	0.88	(0.61–1.27)	0.95	(0.72–1.24)	1.11	(0.79–1.54)
Urban Residence (Ref. = Rural)	0.84*	(0.71–0.98)	0.98	(0.85–1.12)	0.89	(0.78–1.01)
Educational Status (Ref. = No formal schooling)						
Some primary	1.34**	(1.11–1.63)	1.28**	(1.09–1.51)	1.00	(0.85–1.18)
Some secondary	0.94	(0.76–1.15)	1.64***	(1.38–1.95)	0.88	(0.74–1.06)
Some higher	0.51***	(0.36–0.73)	3.19***	(2.38–4.26)	0.95	(0.72–1.26)
Household Wealth Quintile (Ref. = Poorest)						
Poorer	1.08	(0.88–1.33)	1.21	(0.99–1.46)	1.14	(0.95–1.38)
Middle 20%	0.71**	(0.56–0.91)	1.31*	(1.06–1.63)	1.26*	(1.03–1.55)
Richer	0.50***	(0.37–0.66)	1.31*	(1.04–1.64)	1.35**	(1.08–1.69)
Richest	0.61**	(0.44–0.86)	1.14	(0.88–1.49)	1.50**	(1.16–1.95)
Religion (Ref. = Hindu)						
Muslim	1.07	(0.81–1.42)	1.19	(0.95–1.49)	1.17	(0.92–1.47)
Christian	0.82	(0.51–1.33)	1.15	(0.82–1.61)	0.96	(0.67–1.39)
Others	1.13	(0.83–1.53)	1.08	(0.84–1.41)	0.75*	(0.58–0.96)
Social Group (Ref. = Upper caste)						
Scheduled caste	1.17	(0.95–1.44)	1.16	(0.97–1.39)	0.94	(0.79–1.12)
Scheduled tribe	1.40*	(1.02–1.93)	0.92	(0.68–1.24)	1.06	(0.79–1.42)
Other backward class	1.10	(0.90–1.34)	1.02	(0.87–1.21)	1.20*	(1.02–1.42)
Chronic Health Condition (Ref. = None)	0.55***	(0.45–0.67)	0.76***	(0.65–0.89)	1.04	(0.89–1.21)
ADL Dependence (Ref. = None)	0.17***	(0.10–0.29)	0.30***	(0.22–0.41)	0.37***	(0.30–0.47)
Observations	5924		9339		8649	

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Note: All models account for dummy variables for the state of residence, results of which are not presented here.

wealth and health. Compared to men, women have sharply lower odds of contributing to household financial matters, even when other demographic factors such as age, marital status, and living arrangements, and education and wealth are accounted for. An educational gradient is seen in the data, with more educated individuals significantly more likely to be able to contribute to household financial matters. For wealth on the other hand, we do not see a clear gradient emerge. Individuals belonging to the richest quintile are neither more nor less likely than those in the poorest quintile to contribute to household financial matters, suggesting perhaps that when a household has either a paucity or an abundance of wealth, it is other members of the household who manage financial matters with little role for older members of the household. Poor health is associated with lower odds of contribution to household financial matters. There are also no statistically significant differences between respondents living in rural and urban areas or among any of the social groups. The relationship between living arrangements and contribution to household finances is interesting. Older persons living with a child in the absence of a spouse are less likely than those living with a spouse and a child to contribute to household financial matters, whereas older persons living with their spouse only or by themselves, are, as one would expect, highly involved in their household financial matters. To put it differently, when living with a child, individuals whose spouses are also present in the household contribute more to household financial matters, compared to when the spouse is not present. Since this analysis is limited at the outset to those individuals who have at least one living child, we can also note that the absence of a cohabiting child requires the older persons to be highly involved in their household financial matters.

4.2.3. Grandparenting

The final set of analysis presented in Table 3 relates to the correlates of grandparenting. To recall, only those respondents in the analytical sample who reported that they had at least one grandchild were included in the analysis of being involved in taking care of grandchildren. Unlike the other measures of productive aging that we have seen so far, women are significantly more likely to be involved in grandparenting. Being widowed and living without children, that is alone or with a spouse only, are associated with a lower likelihood of grandparenting. Older persons who live with only children but not a spouse are clearly a key source of support for their children in terms of grandparenting with significantly higher odds of grandparenting. Even after accounting for marital status and living arrangements, there is a wealth gradient in grandparenting. Older persons who are wealthier are more likely to be involved in grandparenting. We find that the presence of an adverse health condition does not affect the odds of grandparenting, whereas ADL dependencies make the older people considerably less likely to be involved in grandparenting.

4.2.4. Social engagement

We turn to the analysis of social engagement in Table 4. We present results from three dependent variables: participation in community, group, or neighbourhood meetings, participation in religious programmes and services, and visiting friends and relatives. We see that the negative association between being female and productive aging as seen in the context of employment and financial contributions persists and is strong in the case of community, group and neighbourhood participation, but absent for religious participation. We do not find any statistically significant relationships for living arrangements or marital

Table 4
Results of logistics regression models of social engagement measures of older persons aged 60 + in India, 2011.

	Community/group meetings		Religious programmes		Non-residential social ties	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Female (Ref. = Male)	0.39***	(0.34–0.45)	0.87	(0.74–1.02)	0.79**	(0.68–0.92)
Age (in years)	0.96***	(0.96–0.97)	1.00	(0.99–1.01)	0.98***	(0.97–0.99)
Marital Status (Ref. = Currently married)						
Widowed	0.76	(0.48–1.21)	1.16	(0.70–1.93)	1.29	(0.76–2.18)
Other	1.16	(0.64–2.09)	0.68	(0.36–1.31)	1.49	(0.85–2.62)
Living Arrangements (Ref. = Living with spouse and child (ren))						
Living alone	1.10	(0.64–1.90)	0.76	(0.43–1.33)	0.84	(0.47–1.52)
With spouse alone	0.91	(0.75–1.09)	1.00	(0.82–1.22)	1.04	(0.86–1.27)
Only with child (ren)	1.26	(0.78–2.04)	0.72	(0.43–1.21)	0.78	(0.45–1.33)
With others	1.16	(0.87–1.54)	0.80	(0.56–1.15)	1.04	(0.73–1.48)
Urban Residence (Ref. = Rural)	0.78***	(0.68–0.89)	1.12	(0.97–1.29)	1.05	(0.92–1.20)
Educational Status (Ref. = No formal schooling)						
Some primary	1.14	(0.97–1.35)	1.01	(0.84–1.21)	1.15	(0.97–1.37)
Some secondary	1.34***	(1.13–1.60)	0.93	(0.76–1.13)	1.14	(0.94–1.39)
Some higher	1.68***	(1.28–2.19)	1.16	(0.87–1.56)	1.56**	(1.17–2.07)
Household Wealth Quintile (Ref. = Poorest)						
Poorer	1.07	(0.88–1.30)	1.16	(0.92–1.46)	1.23	(0.99–1.53)
Middle 20%	1.16	(0.94–1.44)	1.22	(0.95–1.56)	1.33*	(1.05–1.68)
Richer	0.98	(0.78–1.23)	1.16	(0.88–1.51)	1.06	(0.82–1.36)
Richest	1.34*	(1.04–1.72)	1.41*	(1.05–1.88)	1.36*	(1.03–1.80)
Religion (Ref. = Hindu)						
Muslim	1.14	(0.92–1.41)	1.65***	(1.32–2.08)	1.05	(0.83–1.32)
Christian	0.63*	(0.44–0.90)	2.10***	(1.55–2.85)	0.96	(0.70–1.31)
Others	1.01	(0.80–1.28)	0.95	(0.73–1.24)	1.05	(0.79–1.39)
Social Group (Ref. = Upper caste)						
Scheduled caste	1.07	(0.90–1.27)	0.73**	(0.60–0.90)	0.90	(0.74–1.11)
Scheduled tribe	1.03	(0.78–1.36)	0.52**	(0.34–0.79)	1.00	(0.71–1.41)
Other backward class	0.89	(0.76–1.05)	0.80*	(0.67–0.97)	1.01	(0.85–1.20)
Chronic Health Condition (Ref. = None)	0.92	(0.80–1.07)	1.15	(0.98–1.35)	1.20*	(1.03–1.41)
ADL Dependence (Ref. = None)	0.65**	(0.50–0.86)	0.52***	(0.38–0.70)	0.49***	(0.36–0.67)
Observations	9339		9339		9339	

***p < 0.001, **p < 0.01, *p < 0.05.

Note: All models account for dummy variables for the state of residence, results of which are not presented here.

status across any of the social engagement measures. An educational gradient is seen in the case of community and group meetings, and highly educated older persons have higher odds of maintaining more social ties. Individuals from the richest households are more likely to participate in social activities compared to the poorest, but we do not find any significant association with the other wealth categories. Urban residents are less likely than rural residents to participate in community and group events, indicating that older persons in urban settings may have fewer social interactions compared to their rural counterparts. Unlike our results for employment and financial contributions where we find both measures of adverse health associated with a lower likelihood of productive aging by older persons, it is interesting to note that older persons' social engagement is not adversely affected by chronic health ailments. We also find that those with a chronic condition are more likely than those without to maintain social ties. On the other hand, functional disability measured in terms of dependencies in activities of daily living lowers the likelihood of all forms of social engagement among older persons.

5. Conclusion

The paper set out to test the influence of a set of factors on different aspects of productive aging. A range of indicators covering economic, social and health domains were investigated and the findings illustrate the dynamics of gender, family structure, economic, social and health conditions on these domains. The strength of this approach is that it shows that these factors do not have the same influence across the different productive aging domains. A good illustration of this is educational status, which shows that higher educated older persons are less

likely to work but more likely to participate in community and group meetings compared with older persons with no formal education. This suggests that commonly used indicators of productive aging have different meanings and the same group could be more likely to engage in one set of activities but not in others. This also indicates that efforts to encourage older persons to be more active at older ages will have to contend with the finding that opportunities for productive engagement are not necessarily available to all individuals equally. Research suggests that changing agrarian and urban employment structures are making it increasingly difficult for older persons to find work (Vera-Sanso, 2007, 2010). As was noted earlier, productive aging is not just about individual characteristics but also about the social and structural forces that may enhance or impede productivity as traditionally defined.

Our paper also contributes to an understanding of the relationship between living arrangements and older persons' active lives. Intergenerational co-residence, a hallmark of the filial obligation that characterizes Indian society, lowers the likelihood of older persons being involved in household financial matters and increases their participation in grandparenting. Thus, older persons in such living arrangements do seem to gain economic capital (Samanta et al., 2015), and make greater intergenerational transfers in the form of time spent grandparenting, but at the same time, neither gain nor lose in terms of wider social engagement, with the exception of lowering the likelihood of older persons being currently employed.

For the indicators of productivity considered in this paper, gender has a significant influence on all except participation in religious programmes. Women are less likely to engage in employment, contribute to household financial matters, participate in community and group

meetings and even less likely to actively maintain non-residential social ties by visiting friends and families, but are more likely to do care work within the family such as grandparenting. Gender could also moderate the relationship between many of the variables in our models and productive activities. The effect of marital status and living arrangements, for example, on productive activities could be gendered. Widowhood for women and men have different implications on aging in predominately patriarchal and patrilineal society (Chen, 1997). Further research is needed to understand the gendered aspects of aging and productivity in India.

Besides gender, socio-economic variables such as education and wealth have an influence on productive activities. However, the magnitude and the type of influence vary depending on the type of productive activity. Adverse health conditions have a strong effect on current employment, financial contribution, participation in religious programs, and non-residential social ties but not on social engagement and grandparenting.

Our analysis is limited by the fact that we rely on data that are based entirely on older persons' self-report of their productive engagement. Despite our effort to study productive aging across different domains, we are very likely to be underestimating the extent to which older persons are involved in more informal networks and social interactions. Our data is cross-sectional and as such does not permit a study of productive aging across cohorts or over time, and the extent to which one form of productive activity directly influences another.

Nonetheless, our findings point to the complexities of understanding productive aging and raise the question of what it means to be productive—is it a necessity or choice? The presence of a wealth gradient in employment suggests that continuing work for remuneration at older ages is a matter of necessity. At the same time, wealthier older persons appear to have a greater capacity for taking care of grandchildren. Contribution to household financial matters appears to be a necessity for older persons when they live without their children, whereas older people live in an intergenerational household with their children but not with a spouse are less likely to contribute to financial matters. This is likely because they are not required to contribute financially when they are the only parent living with their children.

We believe that future research on the lives of older persons in India can further examine the relationship between these measures of productive aging and health and wellbeing outcomes. In our study we find that individuals with functional disability have a severe limitation in being productively engaged, even after age and living arrangements are accounted for, and efforts at improving the engagement of older persons both within their households and in a wider social setting will need an added focus on persons with functional disabilities. Future research should also examine the causal relationship between productive aging and loneliness, depression, and expansion or sustenance of social networks. Such studies could be enriched with conceptual models that consider the role of contexts and structural forces. These include the retreat of the state from provision of old age support and care, changing face of rural and agrarian economy, internal migration, and shifts in intergenerational flow of resources.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.socscimed.2018.07.029>.

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