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Women's Aspirations for the Future, and their Financial, Social and Educational Investments in India

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Title: Women's aspirations for the future, and their financial, social and educational investments in India[1]

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Women's aspirations for the future, and their financial, social and educational investments in India

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While the formation of aspirations and their role in determining investments have been modelled theoretically by economists, the empirical investigation of these formative factors and relationships is relatively unexplored. We examine the correlates of aspirations of rural women around income, asset ownership, social status and the education of their children, using primary data from India. We then investigate how the gaps between current and aspired-to status are associated with individual investments in financial, social status-related, and educational dimensions. We find that reference groups are important correlates of aspirations formation in some cases, with aspirations for assets and social status being influenced by those who are 'wealthier' or more socially connected, respectively. However, income aspirations are influenced almost entirely by current status. Compared to related studies, we find considerably weaker evidence on the relationship between aspirations gaps and investments. Current and aspired-to income and social-influence gaps and related investments show the closest relationships. Our contribution lies in providing empirical evidence for some of the hypotheses suggested by theoretical models. Given the divergence between our results and those of other studies, we do not recommend generalizing the findings of these models to specific country contexts without adequate investigation.

1. Introduction

Why do the poor underinvest, despite the potential for high returns (Banerjee and Duflo, 2007)? Limited resources, market failure, incomplete or asymmetric information, and institutional features that affect one's ability to appropriate returns may underlie seemingly irrational underinvestment in high-performing assets (Miguel and Kremer 2003; Munshi and Rosenzweig 2006; Duflo, Kremer, and Robinson 2008; Bernard, Dercon, and Taffesse 2011). Many of these reasons are external, shaped by the social, political and institutional systems in which the individual is situated. However, more recent discussions of investment behaviour also point to the importance of *internal* constraints, such as a lack of willpower, short-sightedness, and a lack of aspirations. This paper investigates rural Indian women's "capacity to aspire" (Appadurai 2004) and how these aspirations relate to their will to invest in different assets.

Whether in physical assets, human capital, or social networks, investments suggest that a person is anticipating future benefits. Such forward-looking behaviour is important for economic and social mobility (Carter and Barrett 2006), especially for women who, in most countries and regions of the world, have less land and physical assets, lower rates of membership in groups, more limited access to credit or savings opportunities, and lower levels of schooling than men (FAO 2011). India is no exception to this pattern.[1]

This paper draws on primary data to provide insights into factors that might be associated with rural Indian women's aspirations regarding their own income, social status and assets, as well as their children's education, and to investigate how these aspirations, in turn, are associated with household investments. While our sample is not nationally representative, the richness of the data allows for a deeper investigation than would be possible with nationally representative publicly available datasets.

Appadurai (2004) asserts that aspirations are socially determined, and that the poor may lack "the [aspirational] resources to contest and alter the conditions of their own poverty." In other words, the inability to aspire may be limiting investments directly. Ray (2006), drawing upon Appadurai's work, identifies three concepts underlying the linkage between aspirations and investments: (1) the *aspirations window*, the outcomes of a set of people 'similar' to an individual, also known as her reference group; (2) the *aspirations gap*, which is the gap between actual status and the status to which the individual aspires; and (3) *aspirations failure*, the inability of an individual to attain her own aspirations, which may be the result of a diminished aspirations window or too wide (or too narrow) of an aspirations gap.

While both the theoretical and empirical literature show that aspirations can be influenced externally to encourage higher levels of investment (Beaman et al. 2012; Bernard et al. 2014; Macours and Vakis 2014; Dalton, Ghosal, and Mani 2016), Janzen et al. (2017) argue that external efforts often neglect the drivers of aspirations formation, particularly the interactions between individual aspirations and those of one's peers. In highly stratified societies like India, gender and caste may shape one's identity and further limit the size of one's peer group and narrow one's aspirations window. Identity-based norms pose constraints for many development programs in India, especially those involving women's self-help groups (SHGs) that aim to improve both women's aspirations and their livelihoods. Although these programs often begin by organizing women, increasing their self-esteem and raising their political consciousness, social constructs of gender and caste and the limited resources that poor women control are very real constraints to undertaking the investments necessary to improve their livelihoods (Dubey and Desai 2011).

Similar to Janzen et al. (2017), we test how the composition of a woman's reference group relates to her own aspirations, using reference groups defined by varying degrees of physical and social separation. We then examine how different types of "aspirations gaps" are associated with investments in financial, social status-related, and human capital.

We find that aspirations for income, assets, social status and education are strongly associated to the woman's current level in each of these dimensions, but that different reference groups also matter. Aspirations for assets and social status are positively associated with the average levels of these outcomes among women in the reference groups that have higher levels of assets or social status. Income aspirations, however, are negatively associated with the average level of income among those in the reference groups that have higher or lower income than the woman in question. Finally, aspirations for children's education are positively related to the current level of schooling of the child, and different aspects of the reference groups matter for boys and girls.

We also find that investments in financial assets are positively related to the aspirations gaps in social influence, with the relationship either monotonically increasing or inverted-U shaped. Conversely, income aspirations gaps play a large role in determining social investments, with an inverse U-shape relationship evident between these gaps and some measures of the strength of these networks. We hypothesise that within reference groups, money is viewed as a means for increasing one's social status and vice versa.

2. Conceptual framework

Unlike the standard neoclassical treatment of individual preferences as being 'given', or internally formed, aspirations are determined by both individual and social factors. Not only are aspirations driven by own characteristics, they are also reference-dependent, shaped by the

observable outcomes of those in an individual's reference group (Ray 2006; Bernard, Dercon, and Taffesse 2012). This may consist of people living in the same geographic location (Fafchamps and Shilpi 2008; Knight and Gunatilaka 2012), sharing the same religion or caste (Munshi and Myaux 2006; Janzen et al. 2017), or belonging to the same social networks (Janzen et al. 2017). Different aspects of the reference group may matter for aspirations formation, such as the average level of the outcome in the reference group (Stutzer 2004; Fafchamps and Shilpi 2008; Knight and Gunatilaka 2012), or among those in the reference group who are better-off (Ferrer-i-Carbonell 2005). Gender and caste identities as well as restrictions on female mobility may limit the size or scope of a rural Indian woman's reference group.

In addition to the outcomes of others in the reference group, we also explore how aspirations are influenced by characteristics of the woman and her household. These include the woman's current level of an outcome, the current level of those in her reference group, and her own demographic, socioeconomic, and geographic characteristics.

Identity may also be a factor in aspirations formation. Mukherjee (2015) examines the effect of gender and caste priming on aspirations in India and finds that girls' aspirations and beliefs are biased downwards when gender is primed, while parents of high caste adolescents have higher aspirations and beliefs about income and educational attainment when caste is primed. Identity also affects outcomes: when gender is primed, girls' aspirations and beliefs are significantly lower and learning outcomes are worse. Pasquier-Doumer and Risso Brandon (2015), using longitudinal data from Peru, find that while aspirations of indigenous children are similar to those of non-indigenous children once external constraints are controlled for, the gap between their aspirational and current socio-economic status is nearly two times higher than non-indigenous children, and this might be dis-incentivizing investments.

Other factors can also affect aspirations. Beaman et al. (2012) show that quotas for women in leadership roles in West Bengal increase parental aspirations for the education of their girl child. In Nicaragua, Macours and Vakis (2014) show that proximity to female leaders can affect aspirations, with positive attitudes and enthusiasm of leaders being contagious.

Once formed, how might aspirations drive investment behaviour? Ray (2006) argues that the aspirations gap (and not aspirations per se) affects future-oriented behaviour. Individuals invest in assets to close the gap between their current and their aspired-to status. At low levels of aspirations gaps, the amount of investment needed to close the gap is small. As the gap between current and aspired-to levels increases, the amount of investment required to bridge the gap also increases, up to the point where the aspired-to levels are so much higher than the individual's current level that individuals have little incentive to invest. At this point, individual investment falls discontinuously. The critical level of the aspirations gap at which investment falls depends on certain individual characteristics; individuals who are more patient, have a higher rate of return on their investment, and with an initial higher level of the relevant outcome will have a higher critical level (Janzen et al. 2017). Since there is a distribution of these individual characteristics, this theory implies that one should find, on aggregate, an inverted-U shaped relationship between investments and aspirations gaps. Using data from rural Nepal, Janzen et al. (2017) find reasonably strong evidence of an inverted-U shape between income and education aspirations gaps, and savings behaviour, spending on temptation goods, and annual education-related expenditures.

Understanding the relationship between aspirations and investment is partly motivated by the possibility that one can stimulate investment by raising aspirations. Dalton, Ghosal, and Mani (2016) use a theoretical model to show that policies that raise aspirations could enhance material

outcomes even if they do not relax material constraints. Guyon and Huillery (2016) use data on adolescents from Paris to show that household socioeconomic status can have a large impact on aspirations - with children from households with lower socioeconomic status aspiring to less - and that these aspirations directly affect academic effort and progress. In one south Indian state, Serneels and Dercon (2013) find a large and economically meaningful relationship between mother's aspirations for child schooling, and child grade attainment and test scores. Ross (2017) documents an inverted-U shape relationship between wage aspirations gaps of Indian adolescents at age 12, and subsequent human capital investments at age 19.

In some cases, however, raising aspirations may be insufficient to improve investment outcomes. In a field experiment in Ethiopia, Bernard et al. (2014) show that the screening of documentaries featuring local individuals who had improved their economic circumstances resulted in positive changes in aspirations, but did not directly affect educational enrolments or expenditures on children's education.[2] Galiani, Gertler, and Undurraga (2018)'s multi-country field experiment to test the effect of a slum-housing intervention on the housing aspirations of non-beneficiary neighbours found that while non-treated households' aspirations to upgrade their dwelling were significantly higher compared to the treatment group soon after treatment, there were no effects on housing investments, and these aspirational effects dissipated eight months later. Lybbert and Wydick (2018)'s show that an intervention aimed at increasing hope among 601 microfinance borrowers in Mexico raised aspirations approximately a quarter of a standard deviation, but had statistically insignificant results on enterprise performance.

Motivated by the literature, we will test several hypotheses using our primary data: (1) the formation of aspirations is influenced by the outcomes of others in the individual's reference group; (2) caste and geography are both important aspects of 'proximity', but may operate in

different ways depending on the nature of the investment; (3) individual or household-level characteristics such as education and having a migrant member of the household are associated with aspirations; and (4) there is an inverted-U shaped relationship between aspirations gaps and investments.

3. Data

This study draws on data from a survey of 2,734 households conducted in 2015 in Madhya Pradesh, Orissa, West Bengal, Jharkhand and Chhattisgarh. This was the baseline of an impact evaluation of a nutrition intervention by PRADAN (Professional Assistance for Development Action), a non-governmental organization that has been working with women's collectives across impoverished, food insecure parts of India for more than 30 years.[3]

We use two datasets in our analysis. The women's dataset has information on the respondent woman's characteristics (e.g. marital status, education, age, aspirations and anthropometry), and household characteristics (such as asset ownership and religion and caste of the household head), along with geographical identifiers. This dataset has one observation per household. We merged this with the children's dataset, obtained from the household roster administered as part of the same survey. This dataset contains information on the age, sex, and years of education of the respondent woman's children between the ages of 5 and 21, the ages for which schooling decisions are relevant. The achieved sample size in the children's dataset was 3,723 children from 1,749 households.[4]

3.1 Measurement of aspirations

We use the same questions as Bernard and Taffesse (2014); using their experience from primary data collection in Ethiopia they provide a comprehensive overview of the challenges facing the measurement of aspirations, and propose a simple, yet validated, indicator.

Respondent women were asked about their current status and aspirations relating to four domains – income, assets, own education and social status.[5] Since the average respondent in our sample was past school-going age, we restrict ourselves to her aspirations regarding own income, asset ownership and social status.

For the woman's aspirations regarding herself, two questions were posed:

a. What is the level of [income/assets/social influence] you have at present?
b. What is the level of [income/assets/social influence] you would like to achieve?

For income, responses were in Indian rupees (INR).[6] For asset ownership and social influence, the respondent was shown a 5-rung ladder and asked to select the appropriate level ranging from 1 to 5. Both the aspirations and current status on asset ownership and social status were standardised by subtracting the sample mean and dividing by the sample standard deviation, so that point estimates are interpretable as standard deviations.

In addition, we collected information on respondent women's aspirations for their children's education.[7] The following three questions were asked:

a. What is the level of education you would like/would have liked your son to achieve?
b. What is the level of education you would like/would have liked your daughter to achieve?
c. What is the highest level of education any person can achieve if he/she does not discontinue his/her studies?

While the final question was not posed specifically for the child, it tested the respondent's knowledge of the maximum attainable years of education. Responses were recorded in complete years of formal schooling, ranging from grade one to a Master's degree or equivalent.

4. Methods

4.1 Reference groups

For regressions involving the respondent woman's aspirations for herself, we use two aspects of proximity to define reference groups: 1) all women within the same caste as the respondent woman and 2) all women within a certain geographical area. The caste hierarchy manifests itself today in India in residential clustering, different levels of income and degrees of social status, and differing levels of access to and investment in human capital (Dubey and Desai 2011). One can reasonably expect that women would compare themselves along these dimensions to others within their caste group. The second classification, more common in the literature, is based on geographical proximity. Depending on sample size considerations we use either the village or the block (the smallest administrative unit in India) as the geographical unit to define this reference group.

For regressions involving the respondent woman's aspirations for her children's education, we use reference groups defined along the same two dimensions of proximity as above, but with some changes. First, we use child-age-specific reference groups, since the number of years of education will vary by child age, and it is reasonable to assume that parents will compare their child with others of the same age. Second, we use the block rather than the village as the geographic reference group, since we only have 20 women in each village. Third,

we also use "within block by gender" as an additional reference group since aspirations for child education can differ according to child gender.

4.2 Aspirations formation

We hypothesise that aspirations for a particular domain are associated with a woman's current status, the current level of those in her reference group, and her demographic and socioeconomic characteristics. To examine the associations between the respondent's aspirations for herself and various covariates we estimate Equation 1 below using ordinary least squares (OLS) regressions:

$$Y^{g}_{ihvbds} = \alpha + \beta\overline{Y^{g}_{-\iota}} + \gamma X'_{ihvbds}\delta + Z'_{hvbds}\gamma + \zeta_s + \eta_d + \theta_b + \epsilon_{ihvbds} \quad (1)$$

In Equation 1, Y^{g}_{ihvbds} is the level of aspirations around outcome Y for individual i in household h of village v in block b of district d in state s. The outcome variables are the natural log of income aspirations (in INR), the years of schooling aspired to for children, and the desired levels of social status and asset ownership, both measured on a scale of 1 to 5 as described above.

The superscript indicates that this woman belongs to reference group g. $\overline{Y^{g}_{-\iota}}$ is the mean level of outcome Y among all other individuals in group g. The vector X is a set of individual-level characteristics, including the respondent woman's age, marital status, height and education. Since earnings are likely to drive aspirations, we control for the log of current income in all regressions.

Vector Z includes household-level characteristics, such as household size, the maximum years of education of a male household member, dummies for religion and caste categories, and the number of negative and positive shocks the household experienced in the last 12 months. We

also include state, district and block level fixed effects. Standard errors ϵ_{ihvbds} are clustered at the village level, to account for unobservable village-level factors, such as school quality or availability of employment opportunities.

Using an equation similar to (1), we also study the formation of the respondent women's aspirations regarding the education of their boy and girl children. We restrict the sample to the oldest child of either sex in the household because we ask for the respondent woman's aspirations regarding her children (boy and/or girl), but do not refer to a specific child.[8] This leaves us with 1749 children.

To test whether a woman's aspirations along a given dimension are determined by the average levels of those with higher as well as lower levels in her reference group, we estimate equation (2):

$$Y^{g}_{ihvbds} = \alpha + \beta_1 \overline{Y^{g}_{abovei}} + \overline{\beta_2 Y^{g}_{belowi}} + X'_{ihvbds}\delta + Z'_{hvbds}\gamma + \zeta_s + \eta_d + \theta_b + \epsilon_{ihvbds} \quad (2)$$

This differs from (1) in having two variables, the average level of *Y* among those in group *g* who have a *higher* level of *Y* than individual *i*, Y^{g}_{abovei}, and the average level of *Y* among those in group *g* who have a *lower* level of *Y* than individual *i*, Y^{g}_{belowi}, instead of the group-wide average ($\overline{Y^{g}}$). A similar equation is estimated for the woman's aspirations for her children's education.

4.3 Aspirations and investment

We then examine the association between a woman's 'aspirations gaps' and her household's investment behaviour. We specify the following three groups of investments:

(1) 'Financial' investments – whether the respondent woman is an SHG member; if yes, whether she takes part in the SHG's savings and credit activities; and whether anyone in

the household has taken a loan in the last 12 months. Since SHGs in India function as savings and credit groups, we consider membership a financial investment.

(1) 'Social' investments: the numbers of people with whom the woman has talked in the last month; from whom she thinks she can borrow INR 1000; with whom she can leave her child in case of an emergency; and the natural log of expenditure on special events (e.g. weddings, funerals, dowry) in INR. Such conspicuous expenditure is a common signal of social status in India (Bloch, Rao, and Desai 2004). For the first three types of social investments we use the first component of the principal components analysis (PCA) divided into five location categories: the number of people in the woman's home hamlet, the next closest hamlet, the second closest hamlet, another hamlet within 20 kilometres (km), and a hamlet more than 20 km away.

(2) Education investments: the natural log of total expenditure on schooling in INR (on tuition, pens, notebooks, uniforms, books and other school expenses); and actual years of child education. Because households without school-aged children do not incur education-related expenses, total schooling expenditure regressions are estimated only for households with children between 5 and 21 years of age.

For any given variable W, we define the aspiration gap as the difference between the aspired to value of W (W_{asp}) and the actual value of W (W_{actual}), normalised by the aspired to value of W:

$$W^{gap} = \frac{W_{asp} - W_{actual}}{W_{asp}}$$

Assuming that one always aspires to one's current status at the minimum, and that W_{actual} is bounded below by zero, the measure proposed above lies between 0 and 1. Janzen et al. (2017)

note that individuals with a current level of zero and any aspirations will always have an aspirations gap of 1, making zero current-status individuals with high and low aspirations indistinguishable. To avoid this, we follow (Janzen et al. 2017) and replace zero current reported income with one before calculating the aspirations gap measure.

To study the association between these gaps and investments, we estimate the following equation using OLS:

$$Y_{ihvbds} = \alpha + \beta_1 W_{ihvbds}^{gap} + \beta_2 (W_{ihvbds}^{gap})^2 + \beta_3 s_{ihvbds} + \beta_4 d_{ihvbds} + X'_{ihvbds}\delta + Z'_{hvbds}\gamma + \zeta_s + \eta_d + \theta_b + \epsilon_{ihvbds} \quad (3)$$

In Equation (3), investment outcome Y for individual i in household h of village v in block b of district d in state s is regressed on the aspirations gap and its square, as well as the same set of individual, household and geographic characteristics as in (1). Standard errors are clustered at the village level.

We add two terms to the covariates described above. The first, s_{ihvbds}, is the woman's current status in the dimension. Similar to Janzen et al. (2017), we control for current status because it is likely to drive future investments, independent of aspirations, and because the critical value at which the aspirations gap becomes too large and investments begin to fall depends upon current status. The second term, d_{ihvbds}, is a dummy for the individual having zero current status in a dimension. Since social status and asset ownership measures are reported on a scale from 1 to 5, this dummy only appears for those with zero current reported income. These individuals are likely to be substantially different from others, especially in their investment behaviour.

Regressions of total schooling expenditure include two additional covariates: the number of children between the ages of 5 and 21 in the household, and the proportion of the children aged 5 to 21 in the household who are boys. This allows total expenditure to vary not only by the number of children possibly attending school, but also the gender composition of those children. For the regressions of actual years of child education, we also control for child age and gender.

Finally, for the regressions of financial and social investments on aspirations gaps, we present adjusted p-values for the aspirations gap and its square. The adjusted p-values control the false detection rate, as suggested by Benjamini and Hochberg (1995) and Benjamini, Krieger, and Yekutieli (2006). For child education investments, the regressions are run on two different datasets, so the correction was not necessary.

5. Results

5.1 Sample characteristics

Appendix Table 1 presents descriptive statistics for our sample households. The average respondent woman is 32 years old, has slightly less than 3 years of education, and lives in a household of approximately 5 members. Almost all women are married (92%), more than two-thirds (67%) belong to households where the household head is from the Scheduled Tribe (ST) category, and the overwhelming majority are Hindu (86%). The maximum years of education of male members in the household is about 3 years more than that of the respondent woman, on average. Slightly more than half (55%) of the children are male.

About 38% of the respondents belong to an SHG, and 75% of them participate in SHG savings and credit activities. In 21% of households the mothers report that they took a loan in the year preceding the survey. About 64% of households have school-aged children. Among them,

average school expenditure is INR 1596.3. Slightly under 20% of households with children between 5 and 21 years of age spent nothing on schooling.[9] Expenditures on social events were on average INR 2811.4, and almost 75% of households did not spend anything on events in the year preceding the survey.

On average, in the month preceding the survey, respondent women had conversed with about 21 people in their own hamlet or village and about 7 people in the next closest village. Respondent women felt that they could borrow money from about three people in their own hamlet, and could leave their children with two people from their hamlet in case of an emergency. The number of people with whom the woman had these social relationships declined substantially as geographical distance from her own hamlet increased.

Figure 1 shows the distributions of maternal aspirations for sons' and daughters' education. On average, mothers aspire to half a year more schooling for their sons than their daughters. In addition, the distribution of aspirations for boys' education is slightly to the right of the one for girls' education. These findings are consistent with other work that finds a higher level of parental aspirations for boy children than for girls in India (Beaman et al. 2012; Dercon and Singh 2013). Both distributions peak at grades 10 and 12, the years of the externally conducted standardised certification examinations which determine college admissions and future educational prospects.

[FIGURE 1 HERE]

5.2 Aspirations formation

Tables 1 to 5 provide insight into potential correlates of the respondent's aspirations regarding income, assets, social status and her child's education. In each table, the columns represent different definitions of the proximal reference group. The first three rows present associations

with the average levels of the relevant variable for the entire reference group, the averages among those 'above' the woman (those with a higher value of the variable) and the averages among those 'below' the woman (those with a lower value of the variable), respectively.

Income-related aspirations are significantly positively associated with current income, with a coefficient that is close to one in all cases (Table 1). Although Easterlin 2001 and Stutzer 2004 have previously documented that richer individuals have higher aspirations, we find that the incomes of others in the reference groups are also associated with income aspirations. While the average level of income in the reference group is only significant in the regression using the village as the reference group, the averages among those with more income and among those with less income are both negatively associated with income aspirations. Rather than income aspirations being 'upward looking'- i.e. positively associated with the average levels of these dimensions among those who have more - the increased divergence between a woman's incomes and of those above her may dampen her income aspirations. Similarly, a higher average income among those below her dampens the increase in the respondent woman's income aspirations.

[TABLE 1 HERE]

Scheduled Caste (SC) households have significantly lower aspirations for income than other caste categories, while households with migrant members exhibit higher income aspirations. The respondent woman's height is also positively associated with income aspirations, but other covariates are largely insignificant in most regressions.

Aspirations around asset ownership show almost completely opposite patterns to those for income aspirations (Table 2). First, current asset ownership is negatively associated with asset-related aspirations, significantly so in two models. Second, the average level of asset ownership among reference group members shows no association with asset aspirations. Third,

the average level of assets in the groups above and below the individual are highly significantly positively associated with asset aspirations: aspirations for asset ownership are 'upward looking'. Several other covariates also show interesting associations with asset aspirations: the years of education of both the respondent woman and male household members (strongly positive), the respondent's marital status (strongly positive) belonging to an ST category (strongly negative), and the number of negative and positive shocks experienced by the household in the year prior to the survey (both strongly positive).

[TABLE 2 HERE]

Social status aspirations are also significantly positively associated with current levels of social status (Table 3). The relationship between social status aspirations and the average levels in the reference group differs considerably across the various definitions of reference groups. Within caste groups, social status aspirations rise with the average level of social status in the group, but are not significantly associated with the social status levels either above or below. Social status within a caste group may be quite uniform, making the difference between those above or below insignificant to affect aspirations. However, the positive coefficient on the average within this reference group indicates an aspiration towards the group average. Because the caste-based reference group includes members of the same caste across all geographies, an overall improvement in the social status of group members at a more 'macro' level is positively associated with one's own aspirations in this domain.

[TABLE 3 HERE]

Average levels of social status within a village, on the other hand, are negatively associated with aspirations. Interestingly, when considering geographically-defined reference groups, social status aspirations seem to be driven by a desire for proximity to those who are

more influential and distance from those who are less influential. It is possible that those who are more influential within a village are also from higher-caste groups, which might explain the divergence between the results using caste and village as reference groups for the individual.

Finally, Tables 4 and 5 present results related to educational aspirations for the oldest boy and girl child in the household. In our study sample, the oldest boy is on average 13.2 years old, and the oldest girl is 12.7 years old. Oldest girl children have on average 4.8 years of education (standard deviation 3.8), while oldest boy children have 5.2 years of education on average (standard deviation 3.7).

[TABLES 4 AND 5 HERE]

In these regressions, in addition to caste and geography, we also introduce an additional reference group of gender within a block. We find that for the oldest boy child, the educational attainment of other children within his caste group has no effect on parental aspirations (Table 4). However, the average education of children of the same age within the block who have less education is negatively associated with parental aspirations for education. Since schools admit children of all castes within a certain radius, it is intuitive that the relevant reference group would be geography, not caste. The gender of the other children does not appear to play a role; when restricted to boy children within the same block, the average years of education of other children within the same block shows no association with parental aspirations for the education of their boy child. Finally, in most cases, the child's current education is positively associated with aspirations, indicating a 'learning effect': as the child advances through grades and demonstrates his ability, the parents aspire to greater levels of education for him.

~~[TABLE 4 HERE]~~

The story is quite different for the oldest girl child. The average levels in either caste or geographic reference groups are not associated with parental aspirations for the girl child's education. Within caste groups, the average level of education among girl children who have more education is negatively associated with parental aspirations. Since marriage markets in India are almost exclusively within-caste,[10] this may result from the widely accepted notion that the woman must be less educated than her partner. Within the block and gender reference group, average education among children with less education is negatively associated with parental aspirations. No other reference group characteristics are significantly associated with parental aspirations for girl child education. Like the case of the oldest boy child, the actual years of a girl child's education are positively associated with educational aspirations for her, indicating the effect of parents' learning about their child's ability.

~~[TABLE 5 HERE]~~

Maternal aspirations around the education of the oldest boy and girl child in the household were associated with the years of education of the mother (positive), as well as the maximum years of education of a male household member (positive), and belonging to an ST or SC category (negative).

5.3 Aspirations failures

We turn now to the relationship between aspirations gaps and investment behaviour (Equation 3). For brevity, we present only the coefficients on the aspirations gap measures and indicate which other covariates were significant and in what direction. To account for multiple testing, we adjust p-values (abbreviated as BH (1995) for the method proposed in Benjamini and Hochberg (1995), and BKY (2006) for Benjamini, Krieger, and Yekutieli (2006) for financial and social investments.

None of our financial investments are significantly associated with income aspirations gaps (Table 6). However, all three financial investments are positively related to the aspirations gap in social status and in one case (household loan taking behaviour) negatively related to its square, indicating a concave, possibly inverted-U shaped, relationship between these investments and social status aspirations. These results are robust to adjustments in the p-values.

[TABLE 6 HERE]

Aspirations gaps in asset ownership are also largely insignificant, except in the case of the indicator for whether the respondent woman participates in the SHG savings and credit activities, which is positively associated with the aspirations gap in asset ownership. In this case, the coefficient on the square of the asset aspirations gap is not significant, indicating a positively sloped linear relationship. Again, statistical significance at the 10% level holds even with the adjusted p-values.

Overall, financial investments and income and asset aspirations gaps are not related; our imperfect measures of financial investments may be conflated with social investment in this setting. For example, membership in an SHG is also a social investment that expands the social networks of its participants. Given the dual nature of SHGs, it is perhaps unsurprising that those individuals with greater social status aspirations gaps are also the ones with greater participation in these groups and their savings and credit activities.

Figure 2 graphs the relationships between financial investments and aspirations, with SHG membership, participation in SHG savings and credit activities, and household loan-taking in Panels A, B, and C, respectively. The inverted-U shaped relationship between financial investments and social status aspirations gaps is evident from these figures. Loan taking behavior and income and assets aspirations gaps also show a slight inverted-U shape.

[FIGURE 2 HERE]

In contrast, income and asset aspirations gaps are related to social investments (Tables 7 and 8). Income aspirations gaps show an inverted U-shape relationship with the number of people the respondent can borrow money from and the number of people the respondent can leave her child with in case of an emergency, but have a U-shaped relationship with the number of people the respondent has talked to in the last 30 days. Assets aspirations gaps, on the other hand, have a U-shaped relationship with the number of people the respondent can borrow money from and leave her child with (Table 7), and an inverse-U relationship with the number of people the respondent has talked with in the last 30 days. Total household expenditure on social events also shows an inverted-U shape relationship with income aspirations gaps, but no significant association with either of the other two aspirations gaps measures (Table 8). While adjusting the p-values does cause them to increase, statistical significance at the 10% level is maintained in all but one case.

[TABLES 7 & 8 HERE]

Figure 3 depicts the relationships between social investments and aspirations gaps. The inverted-U-shaped relationship between the number of people the respondent can borrow money from or leave her child with and income aspirations gaps is clear. Household expenditure on events and assets aspirations gaps also show an inverted-U relationship. However, many of the other graphical depictions in Figure 3 reveal either monotonically decreasing or U-shaped relationships.

[FIGURE 3 HERE]

Table 9 presents the results on education investments and aspirations failure. We consider two education investment variables, log total household expenditure on schooling (in INR), and

actual years of child schooling (child-specific). Total household expenditure on schooling is related to social status and assets aspirations gaps in an inverted-U manner. On the other hand, schooling expenditure is negatively associated with income aspirations gaps, and positively with the square of these gaps, indicating a more U-shaped relationship.

[TABLE 9 HERE]

Child education in years has similar associations with aspirations gaps, though not as significant. Child education is positively associated with social status aspirations gaps, and negatively associated with its square, for an overall inverted-U shaped relationship. While a similar inverted-U is suggested with assets aspirations gaps, the coefficients on the gap and its square are not significant. These relationships are shown in Figure 4, where the inverted-U with social status aspirations gaps is evident.

[FIGURE 4 HERE]

7. Conclusion

We used primary data on women from rural India to investigate the correlates of women's aspirations around income, asset ownership, social status and education for their children. Theoretical models of aspirations formation suggest that individuals form aspirations based on their reference groups. In our paper, we define reference groups based on geographical proximity, caste affiliations, and gender (for child education only). Within each of these reference groups, we study how aspirations are related to the average level of the relevant dimension within the entire group; to the average levels of those who have more; and to the average levels of those who have less.

We find that income, social, and educational aspirations are significantly related to one's current status on that dimension. The exception occurs with asset aspirations, where current asset

ownership is negatively related to asset aspirations, possibly because, unlike income, asset accumulation has a 'saturation point' based on the utility of the items being purchased. We also find that belonging to an SC or ST group is almost always negatively associated with a woman's aspirations. Years of marginalization and exclusion of these groups from education, better paying occupations, and even social circles may be responsible for the consistently low aspirations levels observed.

The pattern and strength of the relationship between reference groups and aspirations varies across specifications. Aspirations for asset ownership and social status are 'upward looking'. Income aspirations, conversely, are negatively influenced by the average incomes among those who have more. Within caste-based reference groups, we observe the same pattern in maternal aspirations for daughters' education, although this could also reflect marriage market considerations, or the narrowing of a girls' educational options once she reaches puberty. Our results confirm others' finding of the importance of the aspirations "window" (Stutzer 2004; Ferrer-i-Carbonell 2005; Fafchamps and Shilpi 2008; Knight and Gunatilaka 2012; Janzen et al. 2017). The expansion of this window through programs that improve women's mobility, minimise differences across social groups, or expand adolescent girls' life options, could have significant implications for a rural Indian woman's aspirations along multiple dimensions.

We also find that the evidence for an inverted-U shaped relationship between aspirations gaps and investments is considerably weaker than in Janzen et al. (2017)'s study in rural Nepal. This suggests that theoretical prediction of an inverse U-shape relationship between aspirations gaps and investments may not be robust. Janzen et al. (2017) looked only at income and education aspirations gaps in relation to different measures of investments. In contrast, because we have information on a broader range of aspirations and investment outcomes, we investigate

the relationship between all four aspirations gaps and all types of investments. Aspirations gaps in social status emerge as the most significant correlates of financial investments, with the relationship between several financial investments and the social status aspirations gaps having an inverse U-shape. Total household expenditure on schooling and the years of schooling a child has are both driven largely by social status gaps, and this relationship is also inverted-U shaped. In the Indian context, where education is viewed as a means of social mobility, this result is plausible.

There are several limitations to our analysis. First, we acknowledge that aspirations do not necessarily display a simple one-to-one relationship with the current status of the individual along a particular dimension. For example, income aspirations might also be influenced by current levels of social status, or of education, and not simply by current levels of income alone. Investigating multiple pathways is important to understanding the nuances of aspiration formation. Second, since these results are based on cross-sectional data, our measures of investments are not always future-looking; several are predetermined at the time of data collection. This means our estimates could suffer from reverse causality: aspirations can determine current income, asset and human capital accumulation. Current investments can also shape future aspirations. As additional rounds of data become available, we hope to use aspirations at baseline to study investments over subsequent time periods. Third, and most importantly, none of our estimates can be interpreted as being causal.

Despite these caveats, our results are relevant to current policy discussions. First, women's groups often explicitly aim to raise women's aspirations. Given this focus, it is important to recognise both internal and external factors that may affect a woman's aspirations, which may be outside the purview of these groups. Women's groups that confer both financial

and social benefits may also affect aspirations in different and sometimes opposing manners. Second, even if aspirations can be raised by development policies and programming, they will not necessarily increase investments. Therefore, policies and programs aiming to impact investment behaviour need to change both women's aspirations and their material circumstances. Third, Janzen et al (2017) find strong evidence of inverted-U shape relationships in a similar south-Asian context. Our weaker support for this hypothesis cautions us against generalizing the relationship between aspirations gaps and investments of different kinds, even to study contexts that appear similar *ex ante*.

We aimed to test the hypotheses that women's aspirations are related to aspirations of those in her reference group and that aspirations gaps are associated with investments. While we find support for the former, our findings are inconclusive about how aspirations gaps relate to investment behaviour. This could be due to the actual lack of a relationship, or measurement issues with the investment variables. Future work will require better measures of different types of investments and a better understanding of the types of aspirations that may affect different investments. Qualitative assessments may aid this understanding.

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Tables

Table 1: The formation of income aspirations

	Dependent variable: Income aspirations (INR, natural log)			
Outcomes (in Natural log)	Within caste groups (1)	Within caste groups (2)	Within village (3)	Within village (4)
Average income in reference group	-0.01		0.10**	
	(0.10)		(0.04)	
Average income above respondent		-0.31***		-0.13***
		(0.05)		(0.03)
Average income below respondent		-0.38***		-0.06**
		(0.08)		(0.02)
Current income	0.94***	1.36***	0.94***	1.05***
	(0.01)	(0.07)	(0.01)	(0.02)
Other significant associations: Respondent woman height (+), HH head is SC (-), HH has a migrant member (+)				

N	2627	2617	2627	2372
R^2	0.927	0.939	0.928	0.950

Source: Authors' calculations.

Note:

1. **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; INR = Indian rupee; SC = Scheduled Caste; ST = Scheduled Tribe.
4. All models control for respondent age, marital status, education and body mass index (BMI), the maximum years of education of a male household member, HH size, HH head is ST, HH head is SC, HH head is Hindu, HH has a migrant member, number of negative shocks experienced in the last year, number of positive shocks experienced in the last year, and state, district, and block fixed effects. Caste fixed effects are included in regressions where the reference group is not caste based.

Table 2: The formation of asset aspirations

	Dependent variable: Asset aspirations (scale of 1-5, 1 is lowest)			
	Within caste groups	Within caste groups	Within village	Within village
	(1)	(2)	(3)	(4)
Average asset level in reference group	0.06		0.06	
	(0.50)		(0.06)	
Average asset level above respondent		0.42***		0.11**
		(0.09)		(0.04)
Average asset level below respondent		1.98***		0.44**
		(0.42)		(0.18)
Current asset ownership (scale of 1-5)	-0.04	-0.84***	-0.04	-0.22***
	(0.05)	(0.16)	(0.05)	(0.08)

Other significant associations: Respondent is married (+), respondent education (+), log current income (+), maximum years of education of a male HH member (+), HH size (+), HH head is Scheduled Tribe (ST) (-), number of negative shocks experienced in last year (+), number of positive shocks experienced in last year (+).

N	2628	2620	2628	2362
R^2	0.067	0.093	0.073	0.078

Source: Authors' calculations.

Note:

1. **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household.
4. See notes to Table 1.

Table 3: The formation of social status aspirations

	Dependent variable: Social status aspirations (scale of 1-5, 1 is lowest)			
	Within caste groups	Within caste groups	Within village	Within village
	(1)	(2)	(3)	(4)
Average social status level in reference group	1.07***		-0.19***	
	(0.32)		(0.06)	
Average social status level above respondent		-0.10		0.12**
		(0.16)		(0.05)
Average social status level below respondent		0.29		-0.32***
		(0.27)		(0.10)
Current social status (scale of 1-5)	0.33***	0.31**	0.34***	0.37***
	(0.03)	(0.14)	(0.03)	(0.06)
Other significant associations: Respondent's marital status (+), log current income (+), maximum years of education of a male HH member (+), HH head is Scheduled Tribe (ST) (-), number of negative shocks experienced in last year (+).				
N	2628	2620	2628	2367

R^2	0.190	0.183	0.196	0.178

Source: Authors' calculations.

Note:

1. **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household.
4. See notes to Table 1.

Table 4: Aspirations formation for the oldest boy child

	Dependent variable: Educational aspirations for the boy child (in years)					
	Within caste groups	Within caste groups	Within block	Within block	Within block, by gender	Within block, by gender
	(1)	(2)	(3)	(4)	(5)	(6)
Average education of children of the same age in reference group	0.10		0.16		0.08	
	(0.21)		(0.16)		(0.14)	
Average education of children of the same age with more education		-0.03		0.09		-0.04
		(0.15)		(0.11)		(0.11)
Average education of children of the same age with less education		-0.09		-0.11*		-0.07
		(0.09)		(0.06)		(0.06)
Education of the boy child	0.07	0.21**	0.04	0.17*	0.09	0.19*
	(0.14)	(0.09)	(0.10)	(0.09)	(0.09)	(0.10)

Other significant associations: Child age (-), Respondent education (+), log current income (+), maximum years of education of male HH member (+), HH head is Scheduled Tribe (ST) (-), HH head is Scheduled Caste (SC) (-).

N	895	860	893	689	893	539
R^2	0.256	0.245	0.257	0.233	0.256	0.246

Source: Authors' calculations.

Note:

1. *p<0.10, **p<0.05.
2. Standard errors in parentheses, clustered at village level.
3. HH = household.
4. See notes to Table 1.

Table 5: Aspirations formation for the oldest girl child

	Dependent variable: Educational aspirations for the girl child (in years)					
	Within caste groups	Within caste groups	Within block	Within block	Within block, by gender	Within block, by gender
	(1)	(2)	(3)	(4)	(5)	(6)
Average education of children of the same age in reference group	0.18		0.18		0.06	
	(0.28)		(0.21)		(0.18)	
Average education of children of the same age with more education		-0.41*		-0.19		0.02
		(0.22)		(0.17)		(0.17)
Average education of children of the same age with less education		-0.05		-0.07		-0.15*
		(0.10)		(0.07)		(0.09)
Education of the girl child	0.13	0.42***	0.13	0.37**	0.20*	0.43**
	(0.18)	(0.14)	(0.14)	(0.17)	(0.12)	(0.17)
Other significant associations: Child age (-), Respondent education (+), log current income (+), maximum years of education of male HH member (+), HH head is Scheduled Tribe (ST) (-), HH head is Scheduled Caste (SC) (-).						
N	735	703	735	552	734	401

R^2	0.310	0.307	0.311	0.314	0.309	0.371

Source: Authors' calculations.

Note:

1. *p<0.10, **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household.
4. See notes to Table 1.

Table 6: Financial investments and aspirations gaps

Type of aspirations gaps:	Income aspirations gaps			Social status aspirations gaps			Asset aspirations gaps		
Dependent variable:	SHG member	Participates in SHG savings and credit activities	HH took a loan in last 12 months	SHG member	Participates in SHG savings and credit activities	HH took a loan in last 12 months	SHG member	Participates in SHG savings and credit activities	HH took a loan in last 12 months
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aspirations gap	**-0.18**	**-0.07**	**0.24**	**0.27****	**0.70*****	**0.45*****	**0.05**	**0.75****	**0.22**
	(0.17)	**(0.20)**	**(0.18)**	**(0.12)**	**(0.22)**	**(0.15)**	**(0.17)**	**(0.31)**	**(0.22)**
Standard p-value	*0.27*	*0.72*	*0.18*	*0.03*	*0.00*	*0.00*	*0.76*	*0.02*	*0.33*
BKY (2006) p-value$^{\alpha}$	*0.68*	*0.68*	*0.68*	*0.01*	*0.01*	*0.01*	*1.00*	*0.05*	*0.50*
BH (1995) p-value$^{\beta}$	*0.41*	*0.72*	*0.41*	*0.03*	*0.01*	*0.01*	*0.76*	*0.05*	*0.50*
Square of aspirations gap	**0.20**	**-0.02**	**-0.30***	**-0.26**	**-0.16**	**-0.38***	**-0.04**	**-0.24**	**-0.25**
	(0.17)	**(0.21)**	**(0.18)**	**(0.16)**	**(0.26)**	**(0.22)**	**(0.18)**	**(0.32)**	**(0.23)**
Standard p-value	*0.25*	*0.94*	*0.10*	*0.12*	*0.54*	*0.08*	*0.82*	*0.45*	*0.29*

BKY (2006) p-value[α]	*0.43*	*0.58*	*0.43*	*0.21*	*0.22*	*0.21*	*1.00*	*1.00*	*1.00*
BH (1995) p-value[β]	*0.37*	*0.94*	*0.30*	*0.18*	*0.54*	*0.18*	*0.82*	*0.67*	*0.67*
Other associations	Respondent woman's age (+), maximum education of male household member (+), HH head is SC (- for loan-taking)			Respondent woman's age (+), maximum education of male household member (+), HH head is SC (- for loan-taking)			Respondent woman's age (+), HH head is SC (- for loan-taking)		
N	2588	993	1677	2459	945	1567	2454	943	1567
R^2	0.1	0.16	0.15	0.11	0.18	0.17	0.11	0.17	0.16

Source: Authors' calculations.

Note:

1. *p<0.10, **p<0.05, ***p<0.01. Depicted statistical significance is based on the standard p-values.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; SC = Scheduled Caste. All models control for state, district and block fixed effects. Other covariates include the respondent woman's age, marital status, body mass index (BMI) and education, highest male education in the HH, HH size, HH shocks, the HH having a migrant member, and caste and religion controls. Each regression also controlled for the current level of the dimension along which aspirations were being measured; regressions on income aspirations gaps included a dummy for zero reported income.

α: Adjusted p-values calculated based on Benjamini, Krieger, and Yekutieli (2006)
β: Adjusted p-values calculated based on Benjamini and Hochberg (1995)

Table 7: Social investments and aspirations gaps

Type of aspirations gaps:	Income			Social status			Assets		
Dependent variable: Number of people respondent can	Talk with	Borrow money from	Leave her child with	Talk with	Borrow money from	Leave child with	Talk with	Borrow money from	Leave her child with
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Aspirations gap	**-2.22*** **	**0.88***	**1.31** **	**1.20** **	**-0.32**	**-0.06**	**-1.52** **	**-0.97**	**-2.03***
	(0.81)	**(0.50)**	**(0.62)**	**(0.59)**	**(0.51)**	**(0.55)**	**(0.60)**	**(0.77)**	**(1.08)**
Standard p-value	*0.01*	*0.08*	*0.04*	*0.04*	*0.54*	*0.91*	*0.01*	*0.21*	*0.06*
BKY (2006) p-value [α]	*0.03*	*0.06*	*0.05*	*0.22*	*1.00*	*1.00*	*0.06*	*0.17*	*0.10*
BH (1995) p-value [β]	*0.03*	*0.08*	*0.07*	*0.18*	*0.96*	*0.96*	*0.05*	*0.28*	*0.12*
Square of aspirations gap	**1.65** **	**-1.10** **	**-1.59** **	**-1.29**	**1.15***	**0.48**	**1.95*** **	**2.33** **	**3.11*** **
	(0.72)	**(0.53)**	**(0.65)**	**(0.80)**	**(0.61)**	**(0.56)**	**(0.70)**	**(0.89)**	**(1.09)**
Standard p-value	*0.02*	*0.04*	*0.02*	*0.11*	*0.06*	*0.40*	*0.01*	*0.01*	*0.00*
BKY (2006) p-value [α]	*0.05*	*0.05*	*0.05*	*0.27*	*0.27*	*0.32*	*0.01*	*0.01*	*0.01*

BH (1995) p-value$^{\beta}$	*0.05*	*0.05*	*0.05*	*0.21*	*0.21*	*0.48*	*0.01*	*0.01*	*0.01*
Other associations	Respondent woman age (+), education (+), HH head is SC (-)			Respondent woman age (+), education (+)			Respondent woman age (+), education (+)		
N	1731	1768	1760	1612	1650	1642	1603	1642	1634
R^2	0.22	0.09	0.04	0.21	0.08	0.06	0.21	0.09	0.06

Source: Authors' calculations.

Note:

1. *p<0.10, **p<0.05, ***p<0.01. Depicted statistical significance is based on the standard p-values.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; SC = Scheduled Caste.
4. See notes to Table 6.

α: Adjusted p-values calculated based on Benjamini, Krieger, and Yekutieli (2006)

β: Adjusted p-values calculated based on Benjamini and Hochberg (1995)

Table 8: Expenditure on social events and aspirations gaps

Dependent variable:	**(Natural log of) total expenditure on weddings, funerals etc.**		
Type of aspirations gaps:	**Income**	**Social status**	**Assets**
	(1)	**(2)**	**(3)**
Aspirations gap	**1.37***	**0.04**	**1.09**
	(0.70)	**(0.90)**	**(1.25)**
Standard p-value	*0.05*	*0.96*	*0.39*
BKY (2006) p-value [α]	*0.05*	*1.00*	*0.24*
BH (1995) p-value [β]	*0.07*	*0.96*	*0.39*
Square of aspirations gap	**-1.55***	**-0.79**	**-0.98**
	(0.82)	**(1.12)**	**(1.18)**
Standard p-value	*0.06*	*0.48*	*0.41*
BKY (2006) p-value [α]	*0.05*	*0.32*	*0.11*
BH (1995) p-value [β]	*0.06*	*0.48*	*0.41*
Other associations	Respondent woman's education (+), ST (-), HH size (+), HH has a migrant member (+)		

N	658	630	627
R^2	0.27	0.28	0.28

Source: Authors' calculations.

Note:

1. *p<0.10. Depicted statistical significance is based on the standard p-values.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; ST = Scheduled Tribe.
4. See notes to Table 6.
5. 1077 individuals reported zero total expenditure.

α: Adjusted p-values calculated based on Benjamini, Krieger, and Yekutieli (2006)

β: Adjusted p-values calculated based on Benjamini and Hochberg (1995)

Table 9: Investments in child schooling and aspirations gaps

Type of aspirations gaps:	**Income**		**Social status**		**Assets**	
Dependent variable:	**Log total expenditure on schooling (INR) (1)**	**Child education in years (2)**	**Log total expenditure on schooling (INR) (3)**	**Child education in years (4)**	**Log total expenditure on schooling (INR) (5)**	**Child education in years (6)**
Aspirations gap	-0.90*	-0.22	1.36***	1.13**	1.88***	0.72
	(0.54)	(0.67)	(0.47)	(0.49)	(0.59)	(0.73)
Square of aspirations gap	0.90*	-0.16	-0.69	-1.31**	-1.23*	-0.47
	(0.54)	(0.64)	(0.59)	(0.64)	(0.63)	(0.79)
Other associations	Respondent woman education (+), marital status (+), education (+ for expenditure, - for child schooling), maximum years of education of HH male member (+), HH size (- for child schooling), HH has a migrant member (+ for expenditure), HH head is SC or ST (- for child schooling)					
N	1475	3511	1412	3304	1418	3328
R^2	0.25	0.7	0.27	0.7	0.28	0.7

Source: Authors' calculations.

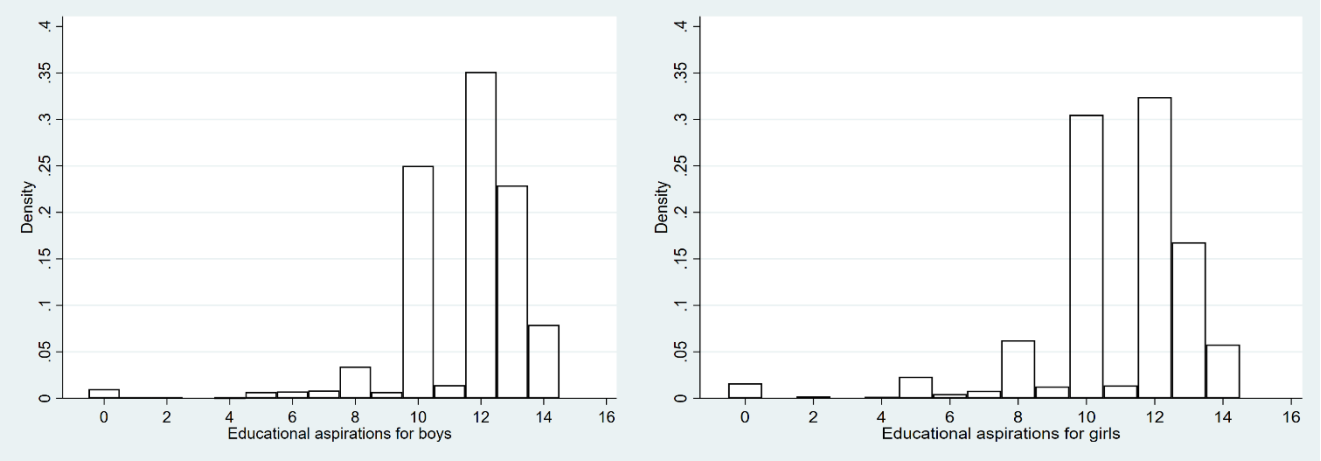
Note:

1. *p<0.10, **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; INR = Indian rupees; SC = Scheduled Caste; ST = Scheduled Tribe.

4. All models control for state, district and block fixed effects. Other covariates include the respondent woman's age, marital status and education, highest male education in the HH, HH size, HH shocks, and caste and religion controls. Regressions on child education also include child age and sex dummies.
5. Total schooling expenditure is the sum of household expenditure incurred on: tuition, pens, notebooks, uniforms, books and other school supplies. Columns (1), (3) and (5) are at the household (not child) level, as the schooling expenditure variable is not distinguished by the child on whom it is spent. Columns (2), (4) and (6) are at the child level.

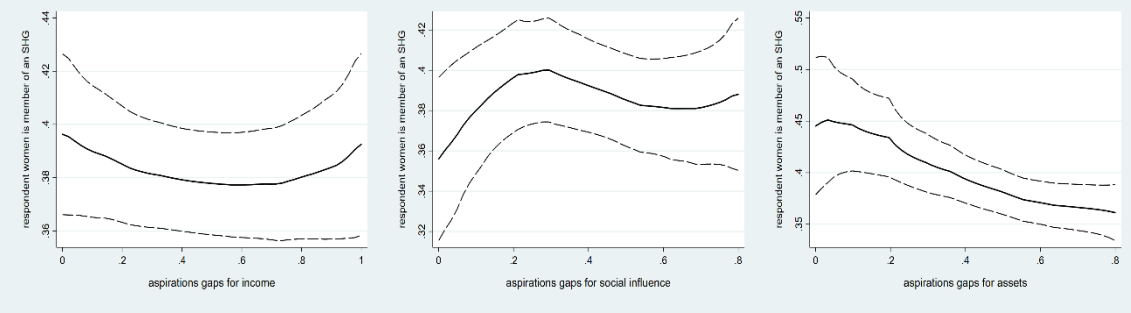
Figures

Figure 1: Parents' aspirations for their children's education - boys versus girls

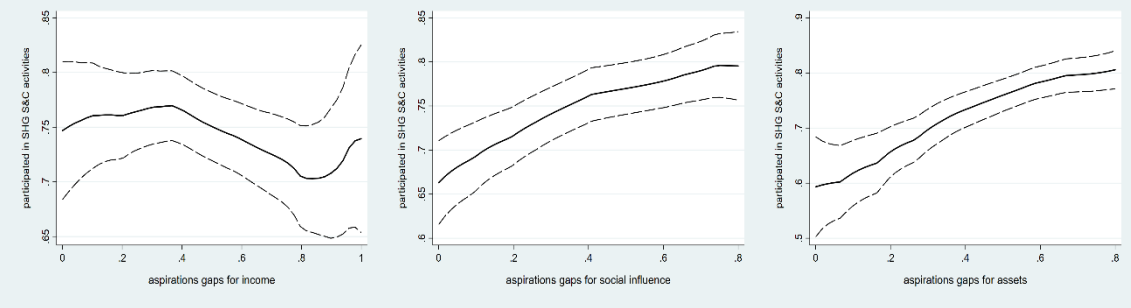


Source: Authors' calculations.

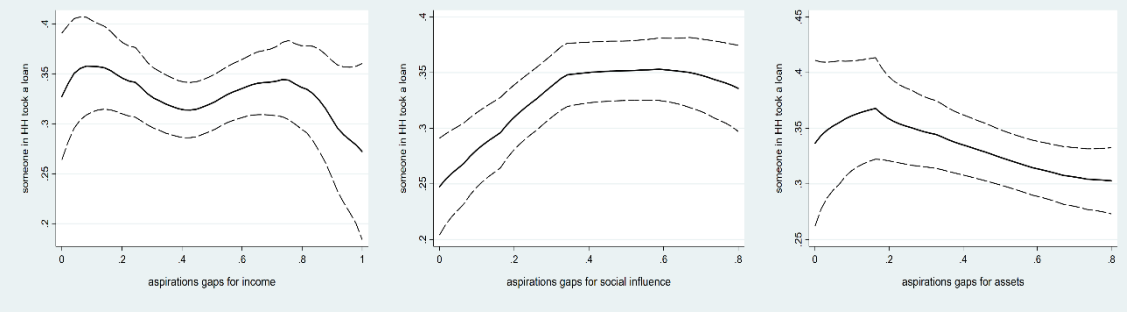
Figure 2: Relationship of financial investments with aspirations gaps



Panel A: Respondent woman is member of an SHG



Panel B: Respondent woman participates in SHG savings and credit activities

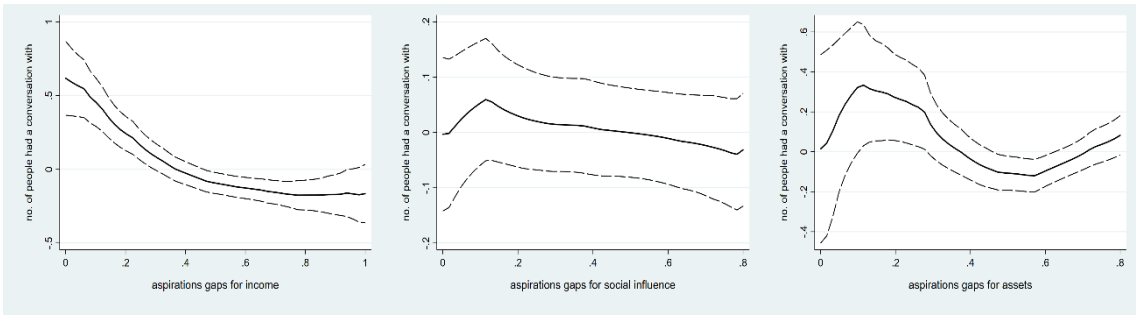


Panel C: Someone in the household took a loan in the preceding one year

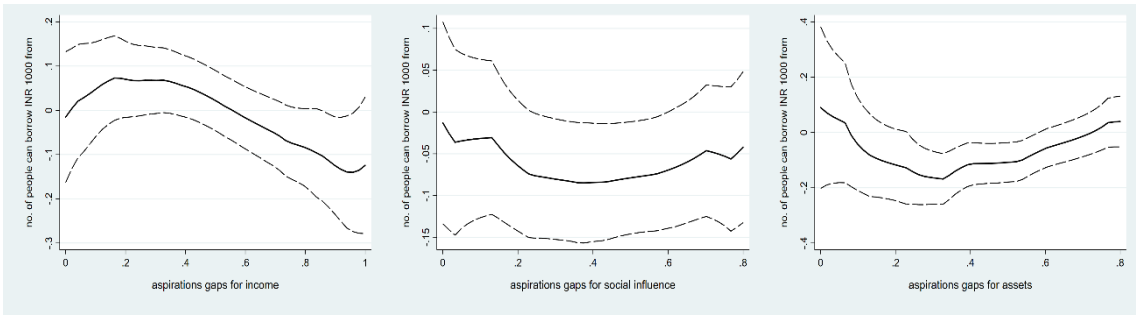
Source: Authors' calculations.

Note: SHG = self-help group.

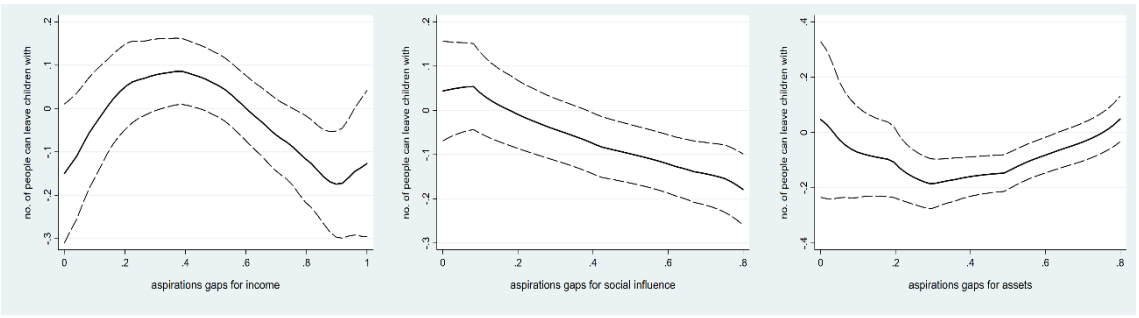
Figure 3: Social investments and aspirations gaps



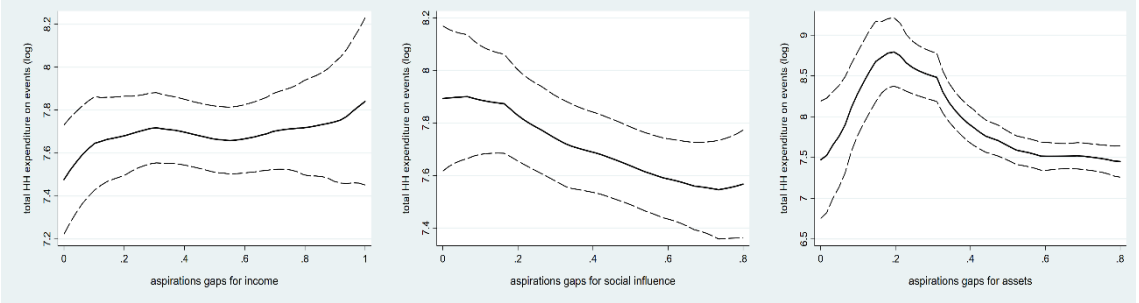
Panel A: Number of people respondent woman has had a conversation with (last 30 days)



Panel B: Number of people respondent woman can borrow INR 1000 from



Panel C: Number of people respondent woman can leave her child with in an emergency

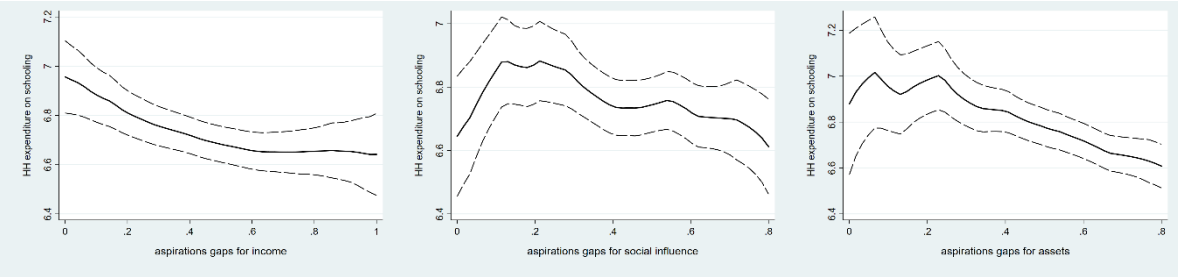


Panel D: Log total household expenditure on events (INR)

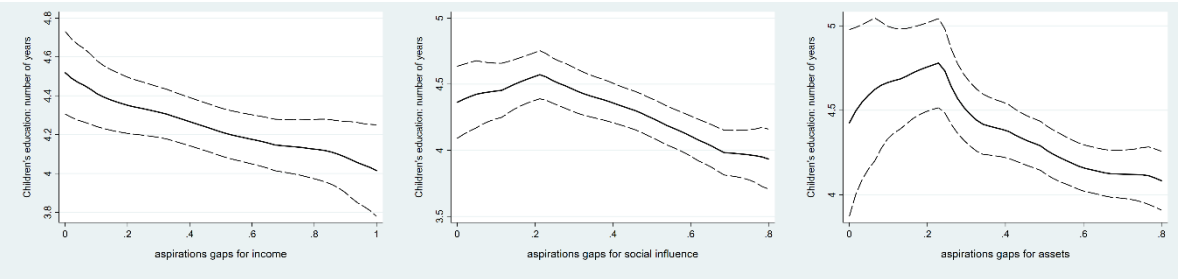
Source: Authors' calculations.

Note: INR = Indian rupees.

Figure 4: Education investments and aspirations gaps



Panel A: Log total household expenditure on schooling (INR)



Panel B: children's education (in years)

Source: Authors' calculations.

Note: INR = Indian rupees.

Appendix

A.1 Sample selection

Districts (n=8) and two intervention blocks per district (n=16) were purposively selected based on PRADAN's presence in those areas. One intervention block in each district continued to receive the standard PRADAN interventions, while the other received these interventions plus a nutrition-intensive behaviour change communication intervention. In each district, one other block was identified as a control block that had no PRADAN presence and was similar to the intervention blocks along five demographic, standard of living, and agricultural dimensions. From each of the two PRADAN blocks, five villages were selected at random from the complete list of villages where PRADAN was operational. From the control block, seven villages were selected from the full list. From each sampled village, 20 ever-married women between the age of 15 and 49 were selected at random.

A.2 Descriptive statistics for the sample and all India

Descriptive statistics for our sample are discussed in the main document. However, our study is not representative of the population in these five states, and given the areas in which PRADAN operates, we are likely to have oversampled more marginalised households. To compare our sample to the relevant population in these five states, as well as the rest of India, columns 3-6 of Appendix Table 1 present descriptive statistics from the district-representative National Family Health Survey (NFHS-4) from 2014-15, for those variables that can be compared across the two surveys. Our respondent is slightly older, less educated, more likely to be Christian, or to belong to a ST group than the average woman in the five states or across India. The highest education among male members in the household is higher in our study sample than in the two comparison groups within the NFHS. The reader should keep these differences in mind while interpreting the generalizability of our findings to other contexts within India.

Appendix Table 1: Descriptive statistics for the study sample, five states, and all India

	Study sample		**Five states (NFHS-4)**		**All India (NFHS-4)**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Variable	**Mean (S.D.)/ proportion**	**N**	**Mean (S.D.)/ proportion**	**N**	**Mean (S.D.)/ proportion**	**N**
Age of respondent woman (in years)	32.9 (8.3)	2734	29.7 (9.8)	1,68,410	29.8 (9.8)	6,99,686
Education of respondent woman (in years)	2.9 (3.2)	2734	4.0 (1.6)	1,13,981	4.1 (1.7)	5,03,130
Respondent woman is married	92.6	2734	73.1	1,68,410	71.4	6,99,686
Respondent woman's height (cm)	150.0 (5.9)	2734				
Maximum years of education of a male member of the HH	6.1 (4.0)	2734	3.1 (2.2)	20,773	3.4 (2.2)	91,993
Household size	4.7 (1.8)	2734	5.7 (2.6)	1,68,410	5.8 (2.7)	6,99,686
Household member migrated in last one year	13.5	2734				
Number of children between the ages of 5 and 21 in the HH	1.4 (1.4)	2734	1.6 (1.4)	1,43,609	1.6 (1.5)	6,01,509
Proportion of children aged 5 to 21 who are male in a HH	55.1	2301	51.0	1,43,609	51.8	4,28,838
Number of negative shocks experienced by HH in previous year	0.6 (0.9)	2734				
Number of positive shocks experienced by HH in previous year	0.3 (0.7)	2734				
Total HH expenditure on schooling (INR)	1282.0 (3944.8)	2734				

Total HH expenditure on schooling among HHs with children aged 5-21 (INR)	1596.3 (4511.1)	1749				
Total HH expenditure on events	2811.4 (23761.8)	2734				
Education of the child (in years)	4.2 (3.6)	3673	5.9 (4.7)	1,18,884	6.5 (4.9)	4,95,724
Age of the child (in years)	11.5 (4.5)	3723	16.3 (10.5)	1,19,162	17.2 (10.96)	4,96,574
Respondent woman aspirations for the education of her girl child (in years)	10.6 (3.1)	3496				
Respondent woman aspirations for the education of her boy child (in years)	11.1 (2.9)	3712				
Religion of household head						
Hindu	86.5	2734	87.2	1,43,609	74.6	6,01,509
Christian	7.3	2734	2.3	1,43,609	8.2	6,01,509
Muslim	0.3	2734	7.9	1,43,609	12.2	6,01,509
Others	5.9	2734	2.6	1,43,609	5.0	6,01,509
Caste of household head						
General	4.7	2734	16.1	1,39,166	21.7	5,77,282
Scheduled Caste (SC)	12	2734	18.3	1,39,166	18.8	5,77,282
Scheduled Tribe (ST)	66.8	2734	25.8	1,39,166	19.8	5,77,282
Other backward classes	16.5	2734	39.3	1,39,166	39.2	5,77,282
Savings and loan-related variables						
Someone in the household took a loan in the last one year	21.1	2734				

Respondent woman is a member of an SHG	38.3	2734
Respondent woman takes part in SHG savings and credit activities (among those who are members)	74.9	1048
Number of people respondent woman had a conversation with		
In own hamlet/village	21.8 (18.0)	2734
In next closest hamlet	7.4 (12.3)	2734
In second closest hamlet	3.7 (8.6)	2734
In another hamlet/village within 20 km radius	1.1 (4.1)	2734
In another hamlet/village more than 20 away	0.2 (1.4)	2734
Number of people respondent woman can borrow INR 1000 from		
In own hamlet/village	2.9 (5.1)	2734
In next closest hamlet	0.8 (1.9)	2734
In second closest hamlet	0.5 (2.0)	2734
In another hamlet/village within 20 km radius	0.4 (1.3)	2734
In another hamlet/village more than 20 away	0.2 (0.7)	2734
Number of people respondent woman can leave her children with in case of an emergency		
In own hamlet/village	2.3 (4.2)	2734
In next closest hamlet	0.5 (1.5)	2734
In second closest hamlet	0.3 (1.4)	2734
In another hamlet/village within 20 km radius	0.2 (0.7)	2734
In another hamlet/village more than 20 away	0.1 (0.7)	2734
Aspirations gaps = (Aspired to value minus actual value)/Aspired to value		

For income	0.27 (0.2)	1718
For assets	0.33 (0.2)	1633
For social status	0.22 (0.2)	1628

Source: Authors' calculations.

Note:

1. HH = household; INR = Indian rupee; SHG = self-help group.
2. Total HH expenditure on schooling includes expenditure on tuition, pens, notebooks, uniforms, books and other school supplies. Total HH expenditure on events includes expenditure on weddings, baptisms, funerals, partial and final lifting of mourning, dowry, pre-dowry, ceremonies after birth and other events.
3. Columns 3 and 4 present summary statistics on all available indicators for the five states in which our study is based – Madhya Pradesh, Chhattisgarh, Jharkhand, Odisha and West Bengal – calculated using the district-representative data from the fourth round of the National Family Health Survey (NFHS-4). Columns 5 and 6 present the same statistics for all of India, again using data from NFHS-4. Where comparable indicators could not be found in NFHS-4, columns have been left empty.

Supplemental material: Robustness Checks

In this section, we present some additional results to allay concerns that our results might not be robust to specification. First, we present the results on child education using education of the youngest rather than oldest child in the household. Second, we present some descriptive statistics to show that aspirations for income, social status and asset ownership, and expectations of what the household can attain are almost identical. This should reduce the concern that households' investment behavior is based on their expectations rather than their aspirations—in our context, these two do not diverge substantially.

S.1 Formation of aspirations for child education

Tables S.1 and S.2 present results for potential correlates of educational aspirations for the youngest boy and girl children respectively. Note that the groups of oldest and youngest children both include those households that have only one child of either sex, which comprises 43 percent of the sample. For the other 57 percent of households where there is more than one child of either gender, we retain the youngest or the oldest depending on the statistic being presented.

[TABLE S.1 HERE]

[TABLE S.2 HERE]

In our sample, youngest children are on average 9.4 years of age, and have 3.0 years of education with a standard deviation of 3.4 years. Youngest girl children have, on average, 0.8 fewer years of education that youngest boy children (2.6 years versus 3.4), but this is likely driven by age since the youngest boy child is 9.9 years old, while the youngest girl is 8.9 years old, on average.

The results are similar to what was observed for the oldest boy and girl children. For youngest boys, there appears to be no relationship with caste-based reference groups, but those based on geography (here, the block) are related; the average education among children within a block has a positive association with maternal aspirations for education (column 3, Table S.1). For youngest girls, the average years of education of all children within the same caste group has a negative association with parental aspirations. We had earlier interpreted

this as a possible marriage market effect, an explanation that might hold here as well. Conversely, when restricted to the block-gender reference group, parental aspirations are "upward-looking." In other words, the coefficient on average years of education among children with more education is positive and significant. No other associations are significant. As with the results on the oldest boy and girl child described above, parental aspirations for both the youngest boy and the youngest girl are strongly positively correlated with the respondent woman's own education, as well as with the highest levels of education among a male member of the household. SC and ST households report significantly lower levels of educational aspirations for their children than households belonging to Other Backward Class (OBC) or General categories. Hindu households report lower levels of educational aspirations for their girl children.

Overall, the patterns of associations between the educational aspirations for the youngest girl and boy children and those of children in the reference groups are like the patterns observed when studying the oldest children instead. This should allay concerns that the results presented above were driven by the birth order of the child in question.

S.2 Aspirations, or expectations?

We also asked the respondent what her expectations regarding household improvements in income, asset ownership or social influence were, with the question posed as follows: What is the level of [income/assets/social influence] that you think your household will reach within five years? Collecting information on these expectations is important to be able to assess whether the woman's reported aspirations are realistic (and hence plausibly driving investments), or completely unrealistic (and hence likely to be uncorrelated with actual household or individual behaviour).

Comparing the distribution of responses in Figure S.1 to those in Figure 1 it is evident that the expectation of the maximum possible years of education follows very similar patterns to parental aspirations for boy or girl child education, with most of the density centred on grades 10 and 12.

[FIGURE S.1 HERE]

In addition, we also asked households about their expectations for income, social status and asset ownership, and use the information provided to compare expectations and aspirations for these three dimensions (Figures S.2, S.3 and S.4). For income, responses were continuous, so we present the kernel densities of both aspirations and expectations (Figure S.2). For assets

and social status responses were elicited on the 5-point scale described above, so we present the histograms of responses (Figures S.3 and S.4). The distribution of aspirations and expectations is very similar in all three cases, reassuring us that our data on aspirations mirrors that on expectations.

[FIGURES S.2, S.3 AND S.4 HERE]

Table S.1: Aspirations formation for the youngest boy child

	Dependent variable: Educational aspirations for the boy child (in years)					
	Within caste groups	Within caste groups	Within block	Within block	Within block, by gender	Within block, by gender
	(1)	(2)	(3)	(4)	(5)	(6)
Average years of education of children of the same age in reference group	-0.03		0.34**		0.19	
	(0.21)		(0.14)		(0.14)	
Average years of education of children of the same age who have more education		-0.26		-0.12		-0.20
		(0.25)		(0.14)		(0.16)
Average years of education of children of the same age who have less education		-0.17		-0.10		-0.14*
		(0.17)		(0.08)		(0.08)
Number of years of education of the boy child	0.20	0.42	-0.02	0.36*	0.08	0.34**
	(0.15)	(0.27)	(0.09)	(0.19)	(0.11)	(0.15)

Other significant associations: Child age (-), Respondent education (+), log current income (+), maximum years of education of male HH member (+), HH head is ST (-), HH head is SC (-).						
N	930	898	930	747	930	588
R^2	0.273	0.270	0.277	0.269	0.274	0.253

Source: Authors' calculations.

Note:

1. *p<0.10, **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; SC = Scheduled Caste; ST = Scheduled Tribe.
4. See notes to Table 1.

Table S.2: Aspirations formation for the youngest girl child

	Dependent variable: Educational aspirations for the girl child (in years)					
	Within caste groups	Within caste groups	Within block	Within block	Within block, by gender	Within block, by gender
	(1)	(2)	(3)	(4)	(5)	(6)
Average years of education of children of the same age in reference group	-0.75***		-0.12		-0.17	
	(0.26)		(0.20)		(0.16)	
Average years of education of children of the same age who have more education		-0.09		0.15		0.29*
		(0.21)		(0.15)		(0.16)
Average years of education of children of the same age who have less education		-0.18		-0.11		-0.22*
		(0.19)		(0.10)		(0.12)
Number of years of education of the girl child	0.66***	0.38*	0.29*	0.05	0.32**	0.22
	(0.18)	(0.21)	(0.15)	(0.13)	(0.13)	(0.17)

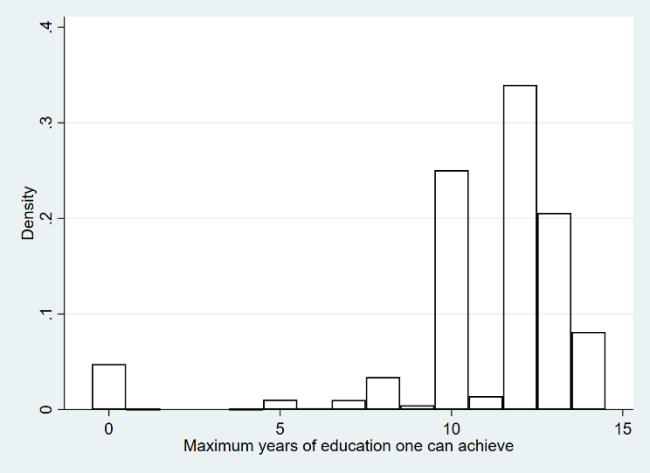
Other significant associations: Child age (-), Respondent education (+), log current income (+), maximum years of education of male HH member (+), HH head is ST (-), HH head is SC (-).						
N	706	681	706	561	706	444
R^2	0.229	0.224	0.223	0.234	0.224	0.252

Source: Authors' calculations.

Note:

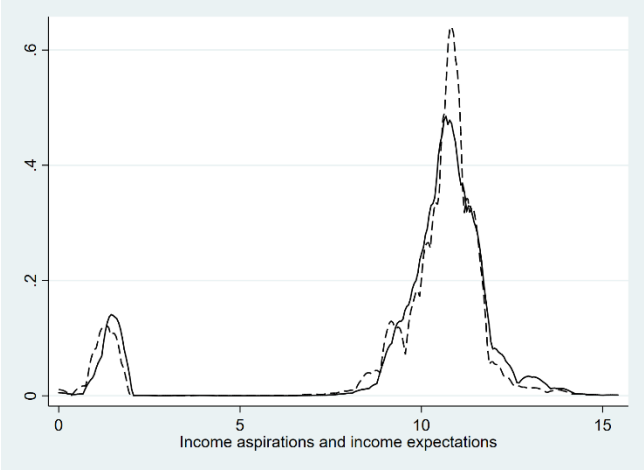
1. *p<0.10, **p<0.05, ***p<0.01.
2. Standard errors in parentheses, clustered at village level.
3. HH = household; SC = Scheduled Caste; ST = Scheduled Tribe.
4. See notes to Table 1.

Figure S.1: Distribution of respondent's answer to the maximum years of education children can achieve



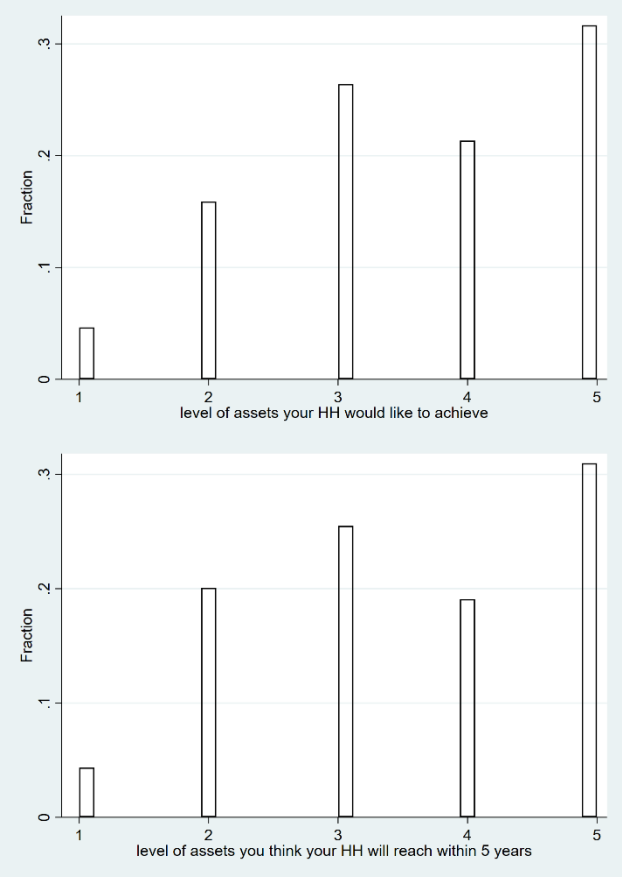
Source: Authors' calculations.

Figure S.2: Income aspirations versus income expectations



Source: Authors' calculations.

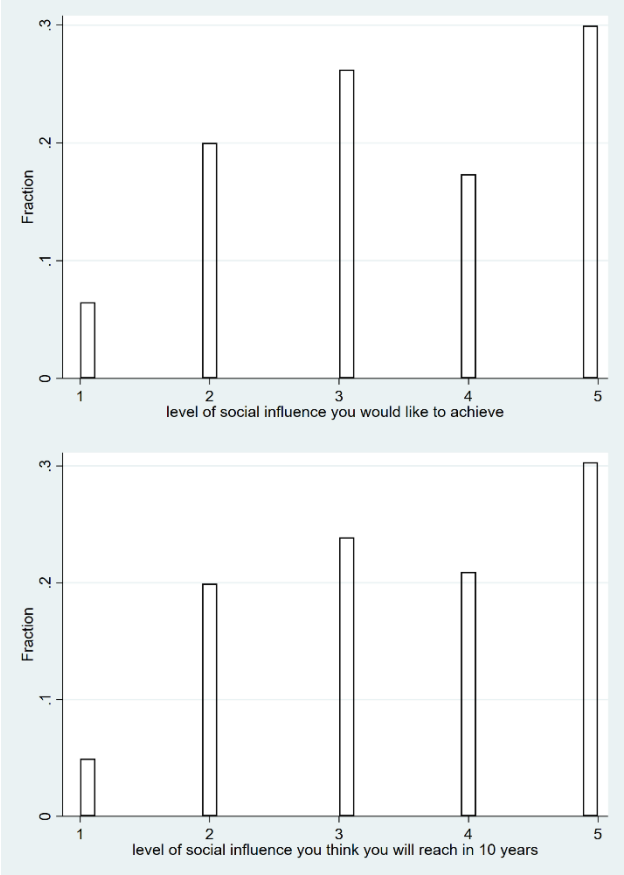
Figure S.3: Asset aspirations versus asset expectation



Source: Authors' calculations.

Note: HH = household.

Figure S.4: Social influence aspirations versus expectations



Source: Authors' calculations.

[1] See http://databank.worldbank.org/data/reports.aspx?source=gender-statistics. In 2015, 62.9% of women aged 15 and above were literate, compared to 80.9% of men in the same age range. In 2014, 42.6% of women aged 15 and above had an account at a financial institution, compared to 62.5% of men in the same age range.

2 Bernard et al. (2014) report evidence of very large indirect effects, where the proportion of children enrolled in school increases 10% from baseline, and schooling expenditures are 16.6% higher with every additional friend in the village who viewed the documentary.

3 More details on the data and sample selection can be found in the Appendix.

4 Not all respondent women had children in the relevant age range.

5 They were also then asked to allocate a set of beans among these four domains, with the quantity of beans indicating their beliefs of the importance of that domain. The allocation of beans is important for aggregating these multi-dimensional aspirations into a single indicator. Since we do not aggregate across domains, we use the responses to the individual questions.

6 As of June 2018, 1 USD = 68.1 INR.

7 The respondent was only asked the question about aspirations for her son (daughter) if she had a son (daughter), but in the case of multiple children of the same sex she was not asked for her aspirations for each individual child.

8 Janzen et al. (2017) resolve a similar issue by defining aspirations gaps using the education of the most educated child in the household. In the Indian context, son-preference is widespread, and preferential investments in the boy child might result in dropping many observations on parental aspirations for the girl child's education. To avoid this, we use the youngest and oldest child in the household instead (see Supplemental material).

9 One concern with using expenditure on schooling as an investment variable is that primary schooling is free of charge, so a lack of expenditure does not indicate a lack of investment. Our expenditure variable captures all types of school investments, including non-tuition expenditures, allowing us to

identify households that do not pay tuition but spend money on other schooling-related inputs. If the sample is restricted to children aged 5 to 18 (the stricter classification of school-going age) the proportion of households spending nothing on schooling is only 13%.

10 According to the 2005 Indian Human Development Survey (IHDS) data, over 95% of Indians marry within their own caste groups.

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