

Beliefs on Inequality in Rural India

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Abstract: This paper explores what villagers in Chhattisgarh, India, see as the main reasons for poverty and inequality, what determines their beliefs, and how their beliefs affect their investment behavior. It tests the assumption of a theoretical model by Piketty (1995), which assumes that family mobility experience affects individuals' belief formation. It proposes that the mobility experiences made by the members of a person's network also affects his beliefs on inequality, and tests this hypothesis. Finally, it studies the different role of subjective and objective measures of income in the process of belief formation.

Key words: Inequality, networks, beliefs

JEL classifications: O12, D63, D85

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I. Introduction

This paper explores what villagers in Chhattisgarh, India, see as the main reasons for poverty and inequality, what determines their beliefs, and how their beliefs affect their investment behavior.

People favor different explanations for why differences in income and wealth exist. The central variables used in theoretical economic models describing beliefs on the determinants of income are effort, family income and luck. They correspond to the main categories of reasons for income inequality established by the psychological literature, which are individual, structural and fatalistic. Individual explanations relate to personal characteristics, structural explanations emphasize how a person's position in society limits his outcomes, and fatalistic explanations highlight the role of luck or destiny.

So far, the determinants of different beliefs on the causes of inequality have been studied in developed countries and among urban populations in developing countries. My paper is the first to analyze data from a rural area of a developing country. I will be using data collected between October 2013 and September 2014 in the framework of the project "Savings Behaviour and the Introduction of Mobile Banking in India" in rural Chhattisgarh.

Previous research has mostly focused on individual explanatory variables (such as race, gender, education, and current income). While the importance of personal and family experience for the formation of beliefs on the role of effort in determining income has been documented in at least two empirical papers, it has not yet been tested whether other reference groups also play a role in this process. This paper tests the importance of family mobility experience and the mobility experience of the members of a person's network. While I find robust evidence on the impact of family mobility for a person's belief on the importance of effort in determining income, the evidence on network mobility experiences is less clear cut and will thus require further research.

Additionally, this paper highlights the importance of distinguishing between subjective and objective measures of income in the process of belief formation. While individuals' subjective family mobility experience has a significant impact on their beliefs, this impact cannot be reproduced using a more objective measure of family mobility.

II. Literature

The economic literature concerned with beliefs on the reasons for inequality is mainly interested in the effect of those beliefs on preferences on redistribution. The general assumption is that individuals are more favorable towards redistribution if they believe that individual effort plays a more important role in determining income than luck or family background. The origins of these beliefs, however, are modelled differently in different theoretical approaches (without necessarily being incompatible). My contribution to the literature will be to empirically investigate the formation of beliefs.

Alesina and Angeletos (2005) build an intertemporal macroeconomic model in which agents derive utility from fairness. They prefer income to be redistributed in such a way as to correct for “unfair” components of income (such as luck) as opposed to “fair” components of income (such as effort). Taxes reduce incentives for effort, and thereby reduce the signal-to-noise ratio between fair (effort) and unfair (luck) components of income. The model generates multiple equilibria: If a society believes that the importance of effort in determining income is high, they choose low taxes, which imply high effort and high inequality. In the other equilibrium, high taxes coexist with low effort and low inequality. The belief in the importance of effort becomes, in a sense, self-fulfilling. The origin of these beliefs is explained to be historical. Importantly, beliefs at any time coincide with the “true” signal-to-noise ratio. They are the same for all agents (as it is a representative-agent model).

Bénabou and Tirole (2005) assume that people’s beliefs are affected by a need to believe in a “just world”, i.e. that effort is the main determinant of income, despite contradicting evidence. This belief serves as a self-motivation to make efforts, and can be passed on to the next generation. Self-motivation is of higher value in a society with low taxes and redistribution, and people who believe that effort determines income are less likely to vote in favor of redistribution. Therefore, comparable to Alesina and Angeletos (2005), the two equilibria emerging from the model are one with low taxes and high just-world beliefs (“America”), and one with high taxes and low just-world beliefs (“Europe”).

Piketty (1995) approaches the question from a microeconomic perspective. Agents choose effort and their preferred tax level based on their beliefs on the importance of effort and family background in determining income. In contrast to Alesina and Angeletos’ (2005) model, there are different types of agents. Their beliefs on the importance of effort follow a process of Bayesian updating, in which agents revise their priors in response to their family’s mobility experience.

There is vast empirical evidence that beliefs on the importance of effort, luck and family background in determining income differ between countries. Alesina and Angeletos (2005), for example, provide cross-country data from the World Values Survey documenting large differences in the percentage of people who believe that luck determines income. In an experiment with Spanish and US-American participants, Rey-Biel (2011) show that, when un-informed about the determinants of income, the Spanish tend to associate poverty with bad luck more than the Americans and accordingly give higher transfers to others. When informed about how income is determined, both nationalities transfer the same amount.

The importance of individual and family experience has also been documented empirically. Di Tella, Galiani and Schagrodsky (2007) exploit a natural experiment in which land squatters in Buenos Aires were allocated property titles exogenously to their personal characteristics. They find that “lucky” squatters, who received legal titles, are more likely to support free market beliefs than “unlucky” squatters. Krashinsky (2007) uses a dataset of twins to document that perceptions of within-family mobility affect preferences on redistribution. He exploits a set of questions in the data which measure each sibling’s perception of the other sibling’s education and earnings. The differences between

perception and the “truth” reported by the other sibling himself capture perceived within-family mobility while using family fixed effects.¹

While the literature has thus established that personal and family experience matter for the formation of beliefs on inequality, the importance of larger networks has not yet been examined. Networks have been shown to matter for individual behavior in many different contexts. Among others, Bandiera and Rasul (2007) show that farmers’ adoption of a new crop (sunflower in Northern Mozambique) is influenced by the adoption decision of their family and friends and members of the same religion, but not of members of other religions. Conley and Udry (2010) find that information about input productivity in one’s information neighborhood affect input choice of pineapple farmers in Ghana.

This paper attempts to connect the literature on beliefs on inequality to the literature on social learning, and to test which reference groups are relevant for the formation of beliefs on the reasons for inequality.

III. Model

The model underlying my empirical analysis is a simplified version of Piketty (1995). While Piketty examines the impact of beliefs on preferences for redistributive policies, I omit his modelling of taxes and keep only his basic model on income, effort and intergenerational mobility.

Individuals receive utility from income and disutility from effort.

$$(1) U_{it} = y_{it} - C(e_{it}) \quad \text{with cost of effort } C(e) = e^2/2a, a > 0$$

Income depends stochastically on effort and social origins. Income can be low (y_L) or high (y_H). The probability that an individual with low (high) income in period t-1 receives high income in period t is given by equation 2 (3).

$$(2) pr(y_{it} = y_H | e_{it} = e, y_{it-1} = y_L) = \pi_L + \theta e$$

$$(3) pr(y_{it} = y_H | e_{it} = e, y_{it-1} = y_H) = \pi_H + \theta e$$

Agents choose effort to maximize utility. As they do not know the true parameters π and θ , they act based on their beliefs $\hat{\pi}$ and $\hat{\theta}$.

$$(4) U_{it} = y_{it} - \frac{e_{it}^2}{2a} = y_H(\hat{\pi}_L + \hat{\theta}e) + y_L(1 - \hat{\pi}_L - \hat{\theta}e) - \frac{e_{it}^2}{2a}$$

$$\text{FOC: } \frac{\delta U_{it}}{\delta e_{it}} = (y_H - y_L)\hat{\theta} - \frac{e_{it}}{a} = 0$$

¹ Note that his results are likely to be driven by “ill-informed” siblings.

$$(5) \quad e_{it} = (y_H - y_L)\hat{\theta}\alpha$$

A higher $\hat{\theta}$, i.e. a higher belief on the importance of effort for determining income, thus leads individuals to exert higher effort.

Agents update their beliefs on the importance of social status and effort. In Piketty's model, this process takes into account the agent's dynasty's experience.

$$(6) \quad \mu_{it+1}(\pi_L, \pi_H, \theta) = \mu_{it}(\pi_L, \pi_H, \theta) \frac{\pi_L + \theta e(\theta(\mu_{it}))}{\sum_{supp(\mu_{it})} \pi'_L + \theta' e(\theta(\mu_{it})) \mu_{it}(\pi'_L, \pi'_H, \theta')}$$

As a result, the outcome of the updating process for an otherwise identical individual depends on his family's last mobility experience:

(7a)	Upwardly mobile:	$\mu_{it+1} \propto \mu_{it} [\pi_L + \theta e(\theta(\mu_{it}))]$
(7b)	Rich:	$\mu_{it+1} \propto \mu_{it} [\pi_H + \theta e(\theta(\mu_{it}))]$
(7c)	Downwardly mobile:	$\mu_{it+1} \propto \mu_{it} [1 - \pi_H - \theta e(\theta(\mu_{it}))]$
(7d)	Poor:	$\mu_{it+1} \propto \mu_{it} [1 - \pi_L - \theta e(\theta(\mu_{it}))]$

IV. Data

I will be using data collected between October 2013 and September 2014 in the framework of the project "Savings Behaviour and the Introduction of Mobile Banking in India" in rural Chhattisgarh. The data consists of 519 household heads and spouses of household heads from 17 villages in the districts of Dhamtari, Gariyabandh and Raipur. The villages for the survey were chosen on the criterion not to have a branch of a cooperative, rural or commercial bank, and households were chosen on the criterion of not having a savings account in any such bank. Therefore, the sample is not representative of the general population, but of unbanked households in unbanked villages.

For all core variables of Piketty's theoretical model (beliefs, effort and income at different t), the Chhattisgarhi dataset offers several empirical counterparts in terms of variables and timing. In addition, different reference groups can be defined, and different set of control variables can be added to the equations. The results presented in the core of this paper are based on a set of variables discussed in this section. Alternative variable specifications will be tested once data cleaning is finalized.

- Income

The data offers the possibility to construct objective weekly income data for different time periods in an interval of 5 months (the financial diaries). Furthermore, it includes self-assessed poverty measures

taken at the baseline and endline of the survey, as well as self-assessed poverty measures for more distant t: the household's past and the respondent's household when he was a child. The subjective measure is on a scale from 1 (Very poor) to 5 (Very rich). In my preferred specification, I use these subjective measures of income, as they reflect the respondent's personal opinion and may thus be more relevant to his belief formation than the objective measures.

- Effort

Effort is available as a self-assessment variable for own current and past effort as well as parents' effort when the respondent was a child. The scale is between 1 (Very little effort) and 5 (A lot of effort). Given that objective effort is not measurable, variables such as hours worked during the last week and average hours worked could serve as a proxy. I again use the self-assessment measures in my preferred specification to reflect the respondent's personal opinion.

- Beliefs

Beliefs are measured by two (sets of) questions: First, respondents are asked whether they agree with the statement "The reason why many people are poor is that..." for a number of reasons, including lack of effort and poverty of parents. Second, respondents are asked to evaluate whether they consider effort or other factors (such as family background and luck) more important determinants of income.² I use the second variable in my preferred specification, as it asks respondents to weight different determinants of income and thus allows for a relative interpretation.

- Mobility

Family mobility is based on a respondents' assessment of his current poverty and of the poverty of his family when he was a child. In order to match Piketty's model, the poverty assessment is split into two categories: low income if they identified themselves as "poor" or "very poor", and high income if they identified themselves as "neither poor nor rich", "rich" or "very rich". If a respondent lived in a low (high) income household in his or her childhood and in a high (low) income household in the present, he is classified as upwardly (downwardly) mobile. If he lived in a low (high) income household in both periods, he is classified as living in a poor (rich) dynasty. In later specifications, more recent mobility experience will be added to the analysis.

- Reference groups

A person can potentially draw information on mobility experience from a variety of different reference groups. In this version of the paper, I test the influence of a person's network (defined as the set of other

² See appendix for the exact formulation of questions.

respondents he self-reports to have known before the start of the survey³), network of the same gender, caste category (forward caste, scheduled caste, scheduled tribe and other backward caste), age group (20-30, 31-40, 41-50, 51-60 and 61-80), education group (no schooling, class 1-5, class 6-9, class 10 and more) and occupation (self-employed versus wage-employed). Other reference groups which will be tested in later versions are groups with similar land ownership and neighbors. In my main specification, I used the share of upwardly mobile, poor, and downwardly mobile individuals in a respondent's network to measure the influence of the network members' experiences on individual beliefs.

V. Empirics

V.1. Summary statistics

On average, respondents' believe that effort is more important in determining income than luck or family background (3.4 on a scale between 1 and 4). 31 percent of respondents come from a rich dynasty, 26 percent were upwardly mobile, 30 percent come from a poor dynasty, and 13 percent were downwardly mobile. The share of each mobility type in respondents' networks is virtually identical to those percentages, which suggests that neither mobility type is over- or underrepresented in the networks. The average size of a respondent's network is 20. Since each respondent was given the names of the 31 other villagers from his village who participated in the survey, this implies that he knew two-thirds of them. Networks are obviously much smaller when they are restricted to respondents who belong to the same gender, age group, education group, caste category or occupation.

³ Note: The information given by two sides of a potential pair is not always consistent. In some occasions, respondent A reported that he knows respondent B, but B reports that he does not know A. This occurred for a variety of reasons, most notably that B may know A's face, but not his name, while A knows B's name. I adopt the following definition: B is part of A's network if A has reported that he knows B. Other definitions will be tested in later versions of this paper.

Table 1: Summary statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Belief: Effort	519	3.395	1.069	1	4
Family: Rich dynasty	519	0.314	0.465	0	1
Family: Upwardly mobile	519	0.258	0.438	0	1
Family: Poor dynasty	519	0.297	0.457	0	1
Family: Downwardly mobile	519	0.131	0.338	0	1
Network: Share of Rich	518	0.317	0.140	0	1
Network: Share of UM	518	0.265	0.110	0	0.667
Network: Share of Poor	518	0.290	0.160	0	1
Network: Share of DM	518	0.128	0.0913	0	0.667
Network size	518	19.65	7.444	1	31
Gender network size	518	10.67	3.936	1	16
Age group network size	491	4.749	2.531	1	12
Education group network size	498	6.970	3.746	1	16
Caste category network size	501	13.56	7.823	1	30
Occupation network size	514	10.02	4.274	1	21
Age	519	43.66	12.90	20	80
Sons	519	1.651	1.113	0	7
Daughters	519	1.534	1.215	0	7
Education	519	3.177	3.581	0	15
HH size	519	5.293	2.406	1	16
Caste category: Scheduled tribe	519	0.133	0.340	0	1
Caste category: Scheduled caste	519	0.133	0.340	0	1
Caste category: Other backward caste	519	0.726	0.446	0	1
Caste category: Forward caste	519	0.00771	0.0875	0	1
Self-employed	519	0.541	0.499	0	1
Wage-employed	519	0.395	0.489	0	1
Salaried	519	0.0193	0.138	0	1
Own TV	519	0.645	0.479	0	1
Migrated	519	0.127	0.333	0	1
Self-assessed effort	519	3.674	1.032	1	5
Parents' effort (self-assessed)	495	4.067	0.919	1	5
Number of siblings	519	3.642	1.880	0	11

V.2. Does the belief in the importance of effort affect effort?

While the main focus of this paper is on the process of belief formation, I start by testing whether higher beliefs on the importance of effort in determining income are related with higher self-reported effort, as predicted by equation (5). I run an ordered logit regression on self-assessed effort, controlling for a number of individual characteristics. The excluded category for caste category is scheduled tribes; the excluded category for occupation is individuals who are not working.

The results (displayed in table 2) suggest a strong positive correlation between a person's belief in the importance of effort in determining income and his self-assessed effort, in line with the predictions of the theoretical model (equation 5).

Table 2: Ordered logit with village fixed effects; standard errors clustered at the village level

	(1)	(2)
VARIABLES	coef	se
SELF-ASSESSED EFFORT		
Belief: Effort	0.216***	(0.0804)
Male	0.396*	(0.207)
Age	0.111**	(0.0478)
Age^2	-0.00179***	(0.000555)
Sons	0.00523	(0.0954)
Daughters	0.0918*	(0.0552)
Education	0.00995	(0.0391)
Own TV	-0.109	(0.222)
Migrated	-0.312	(0.330)
Effort of parents	0.542***	(0.140)
Number of siblings	-0.0320	(0.0402)
Schedule caste	0.615**	(0.309)
Other backward caste	-0.0119	(0.282)
Forward caste	-0.424	(0.387)
Self-employed	1.634**	(0.639)
Wage-employed	1.671***	(0.636)
Salaried	1.367**	(0.589)
Observations	495	

Robust standard errors in parentheses

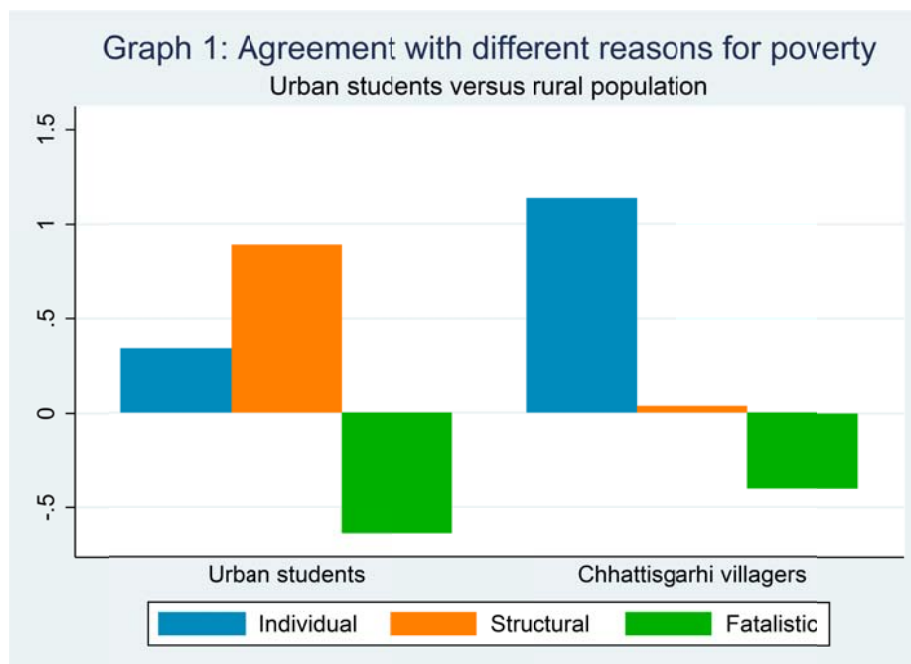
*** p<0.01, ** p<0.05, * p<0.1

Village fixed effects and constants not shown

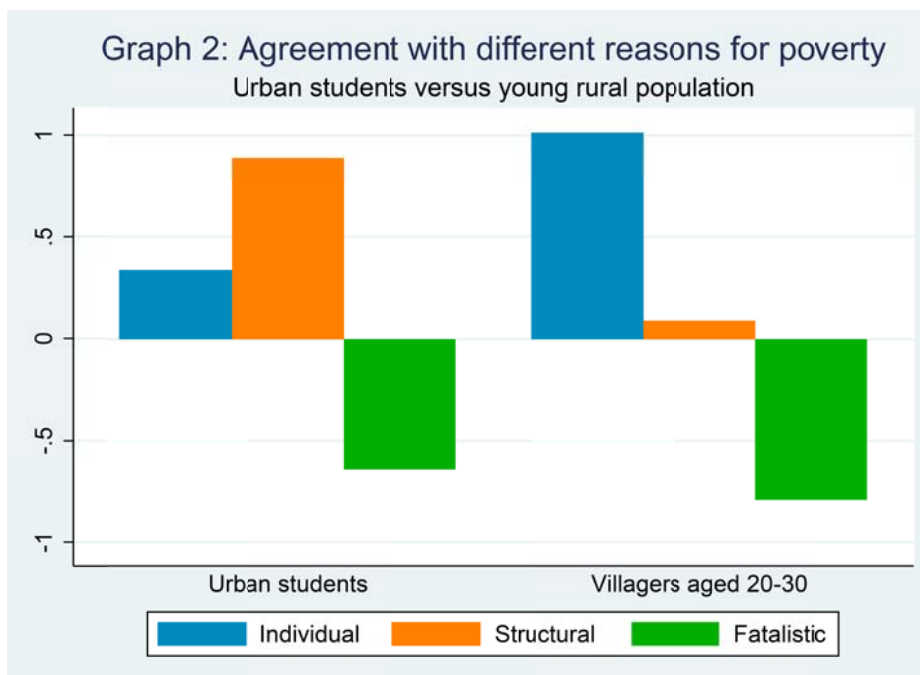
V.3. Are beliefs on inequality similar across India?

While I do not have the necessary data to formally test this question, I can compare the Chhattisgarhi data to the results of a survey administered by Nasser, Singhal and Abouchedid (2005) among postsecondary and university students in an Indian metropolitan city. The authors asked to which degree the students agreed with a set of reasons for poverty, which they classified into three categories: individual, structural or fatalistic explanations. Individual explanations relate to personal characteristics, structural explanations to the government's inability to provide the means for all citizens to thrive, and fatalistic explanations highlight the role of luck or destiny.

In order to compare the opinions of the Chhattisgarhi villagers to the metropolitan students, I classify the questions on respondents' agreement with different reasons for poverty⁴ into the same categories. Talent, effort and money management (QC10.1a-c) are classified as individual, connections, exploitation and parents' poverty (QC10.1d-f) as structural, and destiny and luck (QC10.1h-i) as fatalistic reasons. As caste can be classified in different categories according to a person's religious views, I exclude it from this comparison. I adjust the scale of both data sources to range from 2 (strongly agree) to -2 (strongly disagree), and compare the mean agreement with the different categories of reasons. As can be seen in the graph below, the Chhattisgarhi villagers are more likely to agree with individual and less likely to agree with structural reasons for poverty than the metropolitan students.



⁴ QC10.1, see appendix.



As the Chhattisgarhi data is based on interviews with household heads or their spouses, the age distribution is likely to be very different from the student sample. However, if we compare the students with the bottom age quintile of the Chhattisgarhi data (age 20-30), the result is almost identical (see graph below). The difference in beliefs about the reasons for poverty does not seem to be driven by age.

I do not have access to the data collected by Nasser, Singhal and Abouchedid (2005), which is why I cannot test the significance of these differences or engage in more detailed analysis. Nonetheless, this comparison provides suggestive evidence that substantial differences in beliefs on inequality exist between different population groups in India. The puzzle presented by these differences is that urban students are much more likely to come from a rich or upwardly mobile family than villagers. If Piketty’s assumption that family mobility drives beliefs on inequality were true, the students would thus be expected to agree more with individual explanations for poverty than the villagers. A potential explanation for this puzzle might be an influence of people’s network on their beliefs: If the students’ networks include more people who are rich despite not displaying above-average individual characteristics, the students might be less inclined to favor individual explanations. This hypothesis will be explored in the following sections.

V.4. Formation of beliefs on inequality – Mobility experience of different reference groups

This section of the paper aims at testing how individuals form their beliefs on inequality, and in particular, if different reference groups are involved in the process of learning.

$$Beliefs_i = \alpha + \beta_1 UM_i + \beta_2 PD_i + \beta_3 DM_i + \gamma_1 \frac{1}{J_i} \sum_{j=1}^{J_i} UM_{ij} + \gamma_2 \frac{1}{J_i} \sum_{j=1}^{J_i} PD_{ij} + \gamma_3 \frac{1}{J_i} \sum_{j=1}^{J_i} DM_{ij} + controls_i$$

The dependent variable in my equation is the belief on the importance of effort in determining inequality, as opposed to other factors such as luck or family background. I inverted the scale of question QC10.2 (see appendix) such that it ranges from 1 (Luck or family background are much more important) to 4 (Effort is much more important). As the outcome is categorical, I estimate the different regression equations using an ordered logit model. The subscript i denotes individual-level variables, and the subscript j refers to the members of an individual's network. J_i is the total number of members in individual i 's network.

Family mobility is constructed as described in section IV. The reference category is "rich dynasty", and I include binary indicators for "upward mobility" (UM_i), "poor dynasty" (PD_i), and "downward mobility" (DM_i). To capture the impact of different networks on a person's beliefs, I include the share of upwardly mobile ($\frac{1}{J_i} \sum_{j=1}^{J_i} UM_{ij}$), poor dynasty ($\gamma_2 \frac{1}{J_i} \sum_{j=1}^{J_i} PD_{ij}$) and downwardly mobile ($\sum_{j=1}^{J_i} DM_{ij}$) individuals in each respondent's network as a dependent variable. I do this for the different networks described in section IV: network, network of the same gender, age group, education group, caste category and occupation type.

A particular feature of my dataset is that the core variables of Piketty's model (self-assessed poverty in the present and in the past, self-assessed effort) are not only available as assessed by the respondent himself, but also as assessed by each one of his network members. This allows me to construct different measures of these variables and to distinguish between subjective and objective experiences. In a first specification, I construct the share of upwardly mobile, poor, and downwardly mobile network members from the self-assessment of each network member (table 3). In a second specification, I instead construct it from the assessment made by the respondent himself. (table 4).

I control for a number of individual and household characteristics, namely occupation type, education, past migration experience, TV ownership (as a proxy for access to information) and household size. The coefficients on these are not reported in the results table. Furthermore, I include self-assessed effort of parents and number of siblings of the respondent, which are reported. Village dummies are included to control for village-specific effects. While the data structure suggests that standard errors might be clustered at the village level, the size of clusters is too small to include clustered standard errors in the regression. For this reason, I use bootstrapped standard errors.

Table 3: All controls. Mobility of network members as reported by network members.

NETWORK	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	-	ALL	GENDER	AGE	EDUCATION	CASTE CATEGORY	OCCUPATION
Family: Upwardly mobile	-0.658* (0.371)	-0.631* (0.379)	-0.647* (0.380)	-0.613* (0.371)	-0.573 (0.369)	-0.652 (0.408)	-0.621 (0.400)
Family: Poor dynasty	-0.994** (0.397)	-0.986** (0.385)	-1.024*** (0.388)	-0.972** (0.412)	-0.936** (0.413)	-1.080** (0.426)	-0.939** (0.408)
Family: Downwardly mobile	-1.270*** (0.406)	-1.247*** (0.431)	-1.257*** (0.436)	-1.096** (0.479)	-1.116** (0.473)	-1.460*** (0.437)	-1.218*** (0.456)
Network: UM		2.472 (2.018)	0.0664 (1.357)	-0.0744 (0.745)	0.784 (0.839)	0.123 (1.717)	1.150 (1.116)
Network: Poor		1.941 (1.806)	-0.0437 (1.125)	0.566 (0.667)	-1.089 (0.832)	-1.350 (1.487)	1.518 (1.265)
Network: DM		1.273 (2.230)	0.239 (1.261)	0.191 (0.827)	-0.00349 (0.943)	-3.176** (1.470)	1.797 (1.208)
Parents' effort (self-assessed)	0.212 (0.135)	0.173 (0.148)	0.197 (0.148)	0.205 (0.151)	0.309** (0.144)	0.211 (0.160)	0.214 (0.150)
Number of siblings	0.160** (0.0719)	0.166** (0.0724)	0.167** (0.0739)	0.144* (0.0767)	0.150** (0.0740)	0.171** (0.0749)	0.158** (0.0739)
Observations	495	494	494	467	474	477	490

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Village FE, additional controls and constants not shown

The coefficients on coming from an upwardly mobile family, a poor dynasty, and a downwardly mobile family are negative and of increasing size and significance level. Compared to a person from a rich family, the upwardly mobile, poor and downwardly mobile believe that effort is less important in explaining income than luck or family background. The coefficient on the number of siblings is positive and significant in all specifications, further highlighting the importance of family experience in the formation of beliefs. The coefficients on all those variables are not significantly affected by the inclusion of the different network definitions (gender, age, education, caste category and occupation network).

The evidence on the network mobility measures is less clear-cut. Most coefficients are insignificant, with the notable exception of the share of downwardly mobile members in the caste category network, which is large and negative. This suggests that respondents who have seen a large share of their caste category network being downwardly mobile assign considerable less importance to effort.

Table 4: All controls. Mobility of network members as perceived by respondents.

NETWORK	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	-	ALL	GENDER	AGE	EDUCATION	CASTE CATEGORY	OCCUPATION
Family: Upwardly mobile	-0.658* (0.371)	-0.780* (0.458)	-0.597 (0.509)	-0.621 (0.594)	-0.726 (0.564)	-0.745 (0.583)	-0.907* (0.495)
Family: Poor dynasty	-0.994** (0.397)	-0.986** (0.490)	-1.080* (0.567)	-0.938 (0.613)	-0.900 (0.596)	-1.176** (0.571)	-0.774 (0.538)
Family: Downwardly mobile	-1.270*** (0.406)	-1.518*** (0.494)	-1.557*** (0.600)	-1.297* (0.700)	-1.510** (0.593)	-1.707*** (0.611)	-1.542*** (0.558)
Network: Perceived as UM		0.229 (0.894)	0.00772 (1.009)	-0.988 (0.855)	-0.618 (0.826)	0.175 (1.064)	0.515 (0.920)
Network: Perceived as Poor		-0.547 (0.580)	0.0116 (0.682)	0.0247 (0.720)	-0.673 (0.738)	0.216 (0.636)	-0.487 (0.693)
Network: Perceived as DM		-0.845 (0.797)	-1.027 (0.939)	-0.0858 (0.790)	-1.280 (0.964)	0.0134 (0.892)	-0.565 (0.708)
Parents' effort (self-assessed)	0.212 (0.135)	0.237 (0.168)	0.119 (0.196)	0.287 (0.219)	0.304 (0.216)	0.245 (0.194)	0.247 (0.194)
Number of siblings	0.160** (0.0719)	0.153* (0.0846)	0.157 (0.0955)	0.197* (0.114)	0.181 (0.119)	0.187* (0.100)	0.123 (0.0913)
Observations	495	408	348	316	328	367	372

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Village FE, additional controls and constants not shown

When I compute the share of upwardly mobile, poor, and downwardly mobile in the network from the respondent's perception (table 4) as opposed to the network members' self-assessment (table 3), the results remain very similar. The direction and magnitude of the coefficients on family mobility experience dummies remain the same. The significance level of some coefficients decreases, which may however be caused not by the change in the dependent variable, but by the reduction of the sample size. (Data availability for this specification is reduced because, in many network pairs, respondents were unable to assess their network members' past family income, as they only knew him as an adult). As a robustness check, I run the regressions using the measures from table 3 on the reduced sample from table 4. This regression (table A1 in appendix 2) yields very similar results to table 4, confirming that most of the reduction in significance can be attributed to the smaller sample size.

There is still no evidence for an effect of network members' mobility experiences on beliefs on inequality, all coefficients being insignificant.

V.5. Formation of beliefs on inequality – Mobility experience and effort of different reference groups

A potential reason why no effect of network members' mobility experiences could be found in the previous specifications is that effort of network members was not included in the analysis. If, for example, a respondent has a high share of network members who remained poor despite furnishing a lot

of effort, this might affect his beliefs differently than a high share of network members who remained poor while not furnishing a lot of effort. This is made explicit in Piketty's formulation of the updating process, which accounts not only for mobility, but also for effort.⁵

To explore the role of network members' effort as perceived by the respondents, I apply the following two-step procedure:

First, I run a simple OLS regression of current income on effort and past family income using a different sample for each respondent, namely the members of his network and the values as perceived by him:

$$Income_{ijt} = \alpha + \theta_i * Effort_{ijt} + \pi_i * Income_{ijt-1}$$

I recover the estimates of $\hat{\theta}_i$ and $\hat{\pi}_i$, which are specific to each respondent. These coefficients can be interpreted as the importance of effort and past family income in determining present income as observed by each respondent in his network.

In a second step, I run an ordered logit of beliefs on family mobility dummies, $\hat{\theta}_i$, $\hat{\pi}_i$, and the usual control variables.

$$Beliefs_i = \alpha + \beta_1 UM_i + \beta_2 P_i + \beta_3 DM_i + \gamma_1 \hat{\theta}_i + \gamma_2 \hat{\pi}_i + controls_i$$

Table 5: All controls. Coefficients on effort and income from regression on network.

NETWORK	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	-	ALL	GENDER	AGE	EDUCATION	CASTE CATEGORY	OCCUPATION
Family: Upwardly mobile	-0.658*	-0.646	-0.380	-0.198	-0.622	-0.748	-0.475
	(0.371)	(0.519)	(0.704)	(0.897)	(0.715)	(0.660)	(0.619)
Family: Poor dynasty	-0.994**	-0.797	-0.681	-0.478	-0.451	-1.062	-0.567
	(0.397)	(0.567)	(0.740)	(0.904)	(0.750)	(0.715)	(0.644)
Family: Downwardly mobile	-1.270***	-1.452**	-1.352*	-1.106	-1.353	-1.583**	-1.241*
	(0.406)	(0.585)	(0.821)	(1.038)	(0.835)	(0.678)	(0.677)
Network: Perceived importance of effort (θ)		-0.393	-0.307	-0.646	0.842	-0.132	-0.0969
		(0.500)	(0.712)	(0.625)	(0.648)	(0.426)	(0.479)
Network: Perceived importance of family income (π)		-0.209	0.586	0.385	0.122	0.214	0.0231
		(0.460)	(0.620)	(0.566)	(0.374)	(0.457)	(0.426)
Parents' effort (self-assessed)	0.212	0.201	0.124	0.199	0.120	0.199	0.161
	(0.135)	(0.210)	(0.268)	(0.322)	(0.284)	(0.230)	(0.235)
Number of siblings	0.160**	0.198*	0.147	0.157	0.191	0.219*	0.177
	(0.0719)	(0.101)	(0.122)	(0.168)	(0.156)	(0.126)	(0.123)
Observations	495	357	280	221	258	302	299

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Village FE, additional controls and constants not shown

⁵ Note that the results of table 3 and 4 are not affected by the inclusion of a variable on self-assessed past effort. This suggests that self-assessed effort at the individual level does not affect belief formation.

The size and magnitude of the coefficients on family mobility dummies correspond to those in table 3, but many of them are not significant anymore. Again, this is likely to be caused by the reduction in sample size, as a regression of the specification of table 3 on the sample of table 5 yields very similar results as table 5 (see table A2 in appendix 2).

The coefficients on the perceived importance of effort (θ) and family income (π) are insignificant in all specifications. Once again, there is no evidence for an influence of network mobility experiences on beliefs on inequality.

V.6. Formation of beliefs on inequality – Subjective versus objective mobility experience

In a final specification, I distinguish between self-assessed and “objective” family mobility experience in order to test whether perception or “truth” matter more for belief formation. I replace the self-assessed family mobility dummies by family mobility dummies constructed from the average assessment made by a person’s network members. In other words, family mobility experience is now measured based on the perceptions of a person’s network, as opposed to the person’s own assessment. This measure can be interpreted as more objective than self-assessment, as it is based on the opinion of a larger number of people who are not immediately concerned.⁶

I run this regression for the regression specification controlling only for family mobility dummies, and for the regression specification controlling for shares of mobility types in a person’s entire network. Columns (1) and (3) of table 6 reproduce columns (1) and (2) of the baseline specification (table 3), whereas columns (2) and (4) of table 6 contain the results of the regression based on the “objective” mobility dummies.

While the coefficients on family mobility dummies were significant in the “self-assessment” specification, they turn insignificant when using the “objective” measure. This result suggests that what matters for a person’s beliefs on the determinants of inequality is not his “objective” family experience, but his own perception of his family experience.

⁶ More “objective” measures, based on parents’ occupation and land ownership, will be constructed once the data cleaning of the necessary variables is finalized.

Table 6: Own perceptions of poverty versus average network perceptions of poverty. All controls.

	(1) OWN PERCEPTION	(2) NETWORK'S PERCEPTION	(3) OWN PERCEPTION	(4) NETWORK'S PERCEPTION
Family: Upwardly mobile	-0.658* (0.371)	-0.244 (0.383)	-0.631* (0.379)	-0.185 (0.408)
Family: Poor dynasty	-0.994** (0.397)	-0.346 (0.316)	-0.986** (0.385)	-0.381 (0.358)
Family: Downwardly mobile	-1.270*** (0.406)	-0.275 (0.423)	-1.247*** (0.431)	-0.349 (0.464)
Network: UM			2.472 (2.018)	1.256 (3.034)
Network: Poor			1.941 (1.806)	-0.768 (1.970)
Network: DM			1.273 (2.230)	-3.848 (3.072)
Parents' effort (self-assessed)	0.212 (0.135)	0.252* (0.131)	0.173 (0.148)	0.232 (0.147)
Number of siblings	0.160** (0.0719)	0.154** (0.0705)	0.166** (0.0724)	0.163** (0.0724)
Observations	495	495	494	494

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Village FE, additional controls and constants not shown

VI. Preliminary Conclusion, Discussion and Further Steps

This paper tested the importance of family mobility experience and the mobility experience of the members of a person's network using data from rural Chhattisgarh, India. The results show that individuals whose family was upwardly mobile, a poor dynasty and downwardly mobile are progressively less likely to attribute income inequality to individual effort as opposed to family background or luck. These findings are in line with the assumption made in Piketty (1995) that individuals update their beliefs on inequality based on their family mobility experience. Furthermore, a comparison of results using subjective and objective measures of family mobility suggests that one's own perception of family mobility matters, whereas "objective" mobility doesn't.

While the evidence on the importance of family mobility is robust, I did not find any evidence for the importance of network members' mobility experience on beliefs. This finding may be caused by the fact that people do not take into account their network members' mobility experience in their belief formation. However, a number of other reasons may explain the lack of results:

First, the network definition applied in the current specification might be too broad. Simply "knowing" someone may not be enough to give his experience some weight in the formation of beliefs. Therefore, the next version of this paper will test an alternative network definition, based on whether two persons have already exchanged visits, gifts or loans, which act as a proxy for closer relationships.

Second, the estimations may be imprecise due to the fact that some respondents' networks are very small. A small network may lead to an extreme distribution of mobility types in the network, and these outliers may reduce the significance of the estimation. I will restrict the analysis to individuals with a minimum number of network members to test whether this affects the results.

Finally, and most importantly, the survey sample only contains a very particular population (individuals from unbanked households in unbanked villages) and therefore captures only a part of each respondent's network. Some of the respondents may know rich or upwardly mobile people who moved to more urban areas, and the experience of those acquaintances might have influenced their beliefs. However, the dataset cannot capture this type of variation in respondents' networks. Therefore, the current insignificance of all network mobility measures does not allow us to conclude that networks do not matter for beliefs on inequality. While the survey sample cannot be changed, there are potential remedies to this problem, which will be explored in future versions of this paper.

A first strategy is to weight network members differently according to characteristics which are likely to be correlated with the criteria for being included in the survey sample. For example, some respondents were included in the survey because they did not have a bank account, but opened a bank account during the duration of the survey. These respondents are more likely to resemble respondents who were excluded because of having a bank account. According more weight to such respondents may give a less biased picture of respondents' networks.

A second strategy is to focus on financial shocks to households. The data contain information on a variety of negative shocks to respondents' financial situation, such as loss of crop or livestock, theft of household property or goods, death, or severe illness of a household member. This information is both available as reported by the respondents themselves (with details on the financial loss incurred) and as perceived by their network members (whether the other household was hit by a shock or not). Negative financial shocks are to a large extent exogenous to the household's characteristics and behavior, and can thus be interpreted as an instance of bad luck affecting disposable income. If respondents revise their beliefs on inequality based on their network members' experience, a negative financial shock in their network should lead them to give less importance to effort as a determinant for income.

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Appendix 1: Survey questions

a. Beliefs on inequality

I will now ask you some questions about poverty and poor people in this country. I would like to learn about your own beliefs, so there are no correct or false responses. Please tell me how much you agree or disagree with the following statements:

1...Strongly agree; 2...Agree a little; 3...Disagree a little; 4...Strongly disagree

QC10.1 The reason why many people are poor is that...

QC10.1.a... they are less talented than others

QC10.1.b... they put less effort than others

QC10.1.c ... they do not manage their money well

QC10.1.d ... they do not have the “connections” to find a good job

QC10.1.e... they are exploited by the rich

QC10.1.f ...they had less opportunities than others because their parents were also poor

QC10.1.g... they belong to a particular caste

QC10.1.h ... it is their destiny to be poor

QC10.1.i ... they had bad luck

QC10.2 Some people say that people get ahead by their own effort; others say that luck or one’s family background are more important. Which do you think is most important? *1...Effort is much more important; 2... Effort is slightly more important; 3. Luck or family background are slightly more important; 4. Luck or family background are much more important.*

Appendix 2: Additional regression results

Table A1: Specification 3 with sample of table 4.

VARIABLES	(1) family	(2) all network	(3) gender network	(4) age network	(5) edu network	(6) caste network	(7) occup network
effort_belief1							
Family: Upwardly mobile	-0.658* (0.371)	-0.778* (0.465)	-0.559 (0.516)	-0.777 (0.620)	-0.733 (0.555)	-0.785 (0.580)	-0.828* (0.491)
Family: Poor dynasty	-0.994** (0.397)	-0.988** (0.488)	-1.014* (0.548)	-0.967 (0.641)	-1.000* (0.585)	-1.268** (0.572)	-0.799 (0.519)
Family: Downwardly mobile	-1.270*** (0.406)	-1.614*** (0.509)	-1.567** (0.609)	-1.518** (0.719)	-1.554** (0.618)	-1.908*** (0.608)	-1.614*** (0.579)
Network: UM		3.444 (2.153)	-0.0269 (1.795)	0.709 (1.094)	0.596 (1.411)	2.013 (2.033)	1.081 (1.632)
Network: Poor		2.783 (2.047)	-0.665 (1.595)	1.194 (1.043)	-0.920 (1.163)	-0.559 (1.890)	0.884 (1.622)
Network: DM		0.738 (3.053)	-1.041 (1.902)	-0.720 (1.399)	-0.224 (1.496)	-4.239* (2.572)	0.286 (2.022)
Parents' effort (self-assessed)	0.212 (0.135)	0.194 (0.167)	0.136 (0.199)	0.291 (0.221)	0.307 (0.207)	0.235 (0.206)	0.257 (0.196)
Number of siblings	0.160** (0.0719)	0.153* (0.0830)	0.161* (0.0934)	0.186 (0.115)	0.167 (0.119)	0.195* (0.103)	0.125 (0.0915)
Observations	495	408	348	316	328	367	372

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Village FE, additional controls and constants not shown

Table A2: Specification 3 with sample of table 5: All controls. Mobility of network members as reported by them.

VARIABLES	(1) family	(2) all network	(3) gender network	(4) age network	(5) edu network	(6) caste network	(7) occup network
effort_belief1							
Family: Upwardly mobile	-0.658* (0.371)	-0.564 (0.529)	-0.507 (0.746)	-0.313 (0.942)	-0.571 (0.716)	-0.785 (0.665)	-0.464 (0.630)
Family: Poor dynasty	-0.994** (0.397)	-0.703 (0.569)	-0.832 (0.783)	-0.612 (0.944)	-0.637 (0.821)	-1.215 (0.766)	-0.494 (0.681)
Family: Downwardly mobile	-1.270*** (0.406)	-1.504** (0.585)	-1.458* (0.859)	-1.274 (1.033)	-1.674* (0.891)	-1.903*** (0.712)	-1.174* (0.697)
Network: UM		5.556** (2.572)	-1.626 (3.282)	0.250 (1.748)	0.633 (2.136)	2.921 (2.800)	-0.0894 (2.235)
Network: Poor		3.080 (2.698)	-1.729 (2.831)	0.903 (1.894)	-2.680 (1.746)	-0.197 (2.672)	1.107 (2.270)
Network: DM		2.287 (3.126)	-0.551 (2.788)	-2.227 (2.445)	-2.676 (2.479)	-5.400 (3.346)	1.486 (2.885)
Parents' effort (self-assessed)	0.212 (0.135)	0.155 (0.208)	0.0917 (0.256)	0.183 (0.339)	0.188 (0.296)	0.189 (0.242)	0.141 (0.229)
Number of siblings	0.160** (0.0719)	0.186* (0.100)	0.132 (0.118)	0.143 (0.171)	0.172 (0.158)	0.232* (0.134)	0.174 (0.124)
Observations	495	357	280	221	258	302	299

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Village FE, additional controls and constants not shown