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Mobility, Entitlement and Perceptions of Inequality

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1 Introduction

The importance of people's perceptions regarding political and economic questions has been recognized during recent political campaigns. Newspapers such as the New York Times have argued that "we have entered an age of post-truth politics" (Davies (2016)). Oxford Dictionaries has declared its Word of the Year to be "post-truth" - "an adjective defined as "relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief"" (Oxford Dictionaries (2016)). One explanation for the success of "post-truth" politics is that people do not form their personal beliefs by taking into account nationwide statistics, but by basing themselves on their own and their family's experience. Therefore, individuals' perceptions of a phenomenon differ despite the fact that the economy-wide statistical facts are the same for everyone. As individuals' perceptions shape their political opinions and ultimately their actions, it is important to understand the formation of these perceptions.

This paper highlights a particular example of perceptions, proposing a theoretical model which describes the formation of perceptions of the importance of effort in determining income. Do people believe that income is mostly determined by one's own effort or by other factors such as family background and luck, and what determines these beliefs? Empirical evidence shows that people's perceptions differ according to their family's past and current income status. People whose family has always been rich are most likely to believe that effort matters much more than family background and luck, followed by people who experienced upward income mobility, people who have always been poor and, lastly, people who experienced downward income mobility. I propose a theoretical model which can explain this stylized fact: Income is determined by an one's effort and family background. Individuals form perceptions about the importance of each one of the two elements based on their own and their parents' experience. The model assumes that, while observing current and past income correctly, people do not observe effort precisely. They overestimate the effort they and their parents exerted, to the extent that they feel entitled to maintain their family's past income status. Through this "entitlement" channel, individuals' perceptions differ depending on their income mobility.

The importance of studying people's perception on the importance of effort in determining income is twofold. First, it affects actual effort: a person is more likely to exert high effort if they believe it will have a large impact on their income. Second, it affects preferences for redistribution: those who believe that income is to a large extent determined by individual effort are less in favor of redistributing wealth from rich to poor individuals. This paper focuses more closely on the formation of beliefs on inequality than the previous literature and proposes a behavioural mechanism, "entitlement", which may contribute to the understanding perception-driven social phenomena more broadly in the future.

2 Literature Review

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 are modelled differently in different theoretical approaches (without necessarily being incompatible). My contribution to the literature is to propose and empirically investigate a model of belief formation which explicitly accounts for the experience of the individual and her family background.

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.

My theoretical model is most closely related to Piketty (1995). However, while Piketty is mostly interested in preferences on redistribution, my model focuses only on the process of belief formation and places more restrictions than the Piketty’s Bayesian learning process. I assume that agents do not have a correct perception of effort but overestimate their own and their parents’ effort. In particular, they perceive that their effort is as high as to justify earning at least the maximum of their own and their parents’ income, thus feeling “entitled” to the highest income members of their family have gained in the present or past. This assumption drives the result that individuals’

perception of the importance of effort differs according to their mobility.

The assumption that individuals overestimate their own effort is a type of self-serving bias, i.e. the phenomenon that people hold distorted, overly favorable, beliefs about their own abilities, effort and merit. A well-known example of self-serving bias is that the vast majority of people believe that they drive better than the average, as reported by Svenson (1981). In addition, experiments in social psychology demonstrate that, even when evidence is clear that one's success is heavily influenced by other factors, people tend to attribute it to their own merit. For example, researchers had strangers play a rigged game of monopoly, in which one of two players is randomly assigned to be privileged, which means that he receives twice as much money and is allowed to roll the dice twice as often as the other player. After the game, "when the rich players talked about why they had inevitably won [...], they talked about what they had done [...] to earn their success in the game" (Piff (2013)). On the empirical side, the assumption that people overestimate their effort is backed by findings that hours worked, which can be understood as a measurable component of effort, is regularly overreported by individuals in time surveys. For example, Robinson et al. (2011) find that respondents overestimate their work hours by around 5-10% when comparing estimate questions to time diaries.

This paper contributes to the theoretical literature on beliefs on inequality by studying the formation of beliefs more closely than previous work and by identifying a behavioural channel through which income mobility affects individuals perceptions: the channel of "entitlement". "Entitlement" can be understood as a variant of self-serving bias in which individuals overestimate their own effort in a way which suggests that they would have merited to more than conserve their family's past income level.

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 in perception formation 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.

This paper contributes to this empirical literature by testing the predictions derived from the theoretical model, namely that and how an individual's perception of the importance of effort in

determining income depends on their income mobility.

3 Model

3.1 Formation of Perceptions on the Importance of Effort

An individual i 's income in period t $y_{i,t}$ is determined by effort $e_{i,t}$ and past family income $y_{i,t-1}$. α describes the relative importance of effort and $(1 - \alpha)$ the relative importance of past family income. T is a technology which transforms effort into income.

$$y_{i,t} = \alpha T e_{i,t} + (1 - \alpha) y_{i,t-1} \quad (1)$$

Individuals observe their own current income $y_{i,t}$ and their family's past income $y_{i,t-1}$. They do not observe their own effort $e_{i,t}$ accurately, but have a perception $\tilde{e}_{i,t}$ of it. The equation determining income is therefore perceived as

$$y_{i,t} = \tilde{\alpha}_t T \tilde{e}_{i,t} + (1 - \tilde{\alpha}_t) y_{i,t-1} \quad (2)$$

Solving for the perceived importance of effort $\tilde{\alpha}_{i,t}$ yields

$$\tilde{\alpha}_{i,t} = \frac{y_{i,t} - y_{i,t-1}}{T \tilde{e}_{i,t} - y_{i,t-1}} \quad (3)$$

The numerator captures an individual's mobility. $(y_{i,t} - y_{i,t-1}) > 0$ means that an individual experienced upward mobility, whereas $(y_{i,t} - y_{i,t-1}) < 0$ corresponds to downward mobility, and $(y_{i,t} - y_{i,t-1}) = 0$ to stagnation. The denominator captures the degree of mobility the individual expected to achieve given her own perception of her effort.

Individuals also observe their family's income as a child, $y_{i,t-1}$, and have a perception of their parents' effort $e_{i,t-1}$. As in equations (2) and (3), income in $t-1$ is determined by effort in $t-1$ and income in $t-2$. The perceived importance of mobility in $t-1$ depends on parents' mobility and the mobility they "should have had" according to their children's perceptions.

$$y_{i,t-1} = \tilde{\alpha}_{i,t-1} T \tilde{e}_{i,t-1} + (1 - \tilde{\alpha}_{i,t-1}) y_{i,t-2} \quad (4)$$

$$\tilde{\alpha}_{i,t-1} = \frac{y_{i,t-1} - y_{i,t-2}}{T \tilde{e}_{i,t-1} - y_{i,t-2}} \quad (5)$$

Individuals' perception of α , the importance of effort in determining income, is a combination of their own and their parents' experience as captures in equations (3) and (5). Note that this model abstracts from a direct transmission of the perception of the importance of effort from parents to

children through education or similar channels. It focuses only on the formation of perceptions through the observation of household income and effort.

$$\tilde{\alpha}_i = \theta \tilde{\alpha}_{i,t} + (1 - \theta) \tilde{\alpha}_{i,t-1} = \theta \frac{y_{i,t} - y_{i,t-1}}{T \tilde{e}_{i,t} - y_{i,t-1}} + (1 - \theta) \frac{y_{i,t-1} - y_{i,t-2}}{T \tilde{e}_{i,t-1} - y_{i,t-2}} \quad (6)$$

In conjunction with stylized facts on the distribution of beliefs on the importance of effort depending on individuals' past and present family income, equation (6) will allow us to develop hypotheses on the functional form $\tilde{e}_{i,t}$ and $\tilde{e}_{i,t-1}$ should take for the model to yield α_i in accordance with the data.

3.2 Categories of Mobility

The stylized facts and remainder of the model will be formulated with respect to four categories of people, who differ in current and past household income, i.e. with respect to their income mobility.

Assume that income in any time period can be either high (y^H) or low (y^L). The combinations of low and high income now and in the past determine an individual's category as summarized in table (1). Individuals can be from a rich dynasty (RD), upwardly mobile (UM), from a poor dynasty (PD) or downwardly mobile (DM).

TABLE 1: Mobility categories

		y_t	y_{t-1}
Rich dynasty	RD	y^H	y^H
Upwardly mobile	UM	y^H	y^L
Poor dynasty	PD	y^L	y^L
Downwardly mobile	DM	y^L	y^H

According to the theory, individuals in different categories are expected to differ in their perception of the importance of effort in determining income:

$$\tilde{\alpha}_{RD} \neq \tilde{\alpha}_{UM} \neq \tilde{\alpha}_{PD} \neq \tilde{\alpha}_{DM} \quad (7)$$

3.3 Stylized Facts

In our dataset, individuals from a rich dynasty are much more likely to express the opinion that "effort is much more important than luck or family background" in determining whether people get ahead than people with other mobility backgrounds. While 84% of rich dynasty individuals share this view, only 73% of the upwardly mobile, 68% of those from a poor dynasty and 73% of the downwardly mobile do so.

TABLE 2: Effort is much more important than luck or family background

	No	Yes	
Rich dynasty	26	137	163
	15.95	84.05	100.00
Upwardly mobile	36	97	133
	27.07	72.93	100.00
Poor dynasty	50	104	154
	32.47	67.53	100.00
Downwardly mobile	26	42	68
	38.24	61.76	100.00
Total	138	380	518
	26.64	73.36	100.00

3.4 Perceived Effort

The stylized facts presented above suggest that the relation between the different perceptions of α , the importance of effort in determining income, are as follows:

$$\tilde{\alpha}_{RD} > \tilde{\alpha}_{UM} > \tilde{\alpha}_{PD} > \tilde{\alpha}_{DM} \quad (8)$$

In the following, I will discuss the conditions which need to be fulfilled in the model to yield this ordering.

First, equation (8) implies that $\tilde{\alpha}_{UM} > \tilde{\alpha}_{PD}$ and $\tilde{\alpha}_{RD} > \tilde{\alpha}_{DM}$. Put otherwise, among individuals whose past family background is identical, those with a high current income believe that effort is more important than those with a low current income. Higher current income leads to higher $\tilde{\alpha}$, which is equivalent to stating that the derivative of equation (6) with respect to current income must be positive. Taking the derivative of $\tilde{\alpha}_i$ (equation (6)) with respect to current income yields

$$\frac{\delta \tilde{\alpha}_i}{\delta y_{i,t}} = \theta \frac{1}{T\tilde{e}_{i,t} - y_{i,t-1}} \quad (9)$$

By definition, θ , the weight of one's own experience with respect to one's parents' experience, lies between 0 and 1. For the derivative to be positive, it is necessary that $\theta > 0$, i.e. one's own experience must be taken into account in the formation of perceptions. More importantly, a positive impact of current income on $\tilde{\alpha}_i$ requires that

$$T\tilde{e}_{i,t} > y_{i,t-1} \quad (10)$$

Put otherwise, the perception of one's current effort must be such that an individual is under the impression that their effort should have yielded a larger income than the one earned by their parents. Equation (10) can be understood as an "entitlement condition", as individuals' feel entitled to, at least, conserve the wealth level of their parents'.

Second, equation (8) implies that $\tilde{\alpha}_{RD} > \tilde{\alpha}_{UM}$ and $\tilde{\alpha}_{PD} > \tilde{\alpha}_{DM}$. This means that, given current income, the impact of past income on the perceived importance of effort is positive when current income is high ($\tilde{\alpha}_{RD} > \tilde{\alpha}_{UM}$) and negative when current income is low ($\tilde{\alpha}_{PD} > \tilde{\alpha}_{DM}$). This condition relates to the derivative of equation (6) with respect to past income, which is

$$\frac{\delta \tilde{\alpha}_i}{\delta y_{i,t-1}} = \theta \frac{y_{i,t} - T\tilde{e}_{i,t}}{(T\tilde{e}_{i,t} - y_{i,t-1})^2} + (1 - \theta) \frac{1}{T\tilde{e}_{i,t-1} - y_{i,t-2}} \quad (11)$$

This derivative should be positive if current income is high,

$$\theta \frac{y^H - T\tilde{e}_{i,t}}{(T\tilde{e}_{i,t} - y_{i,t-1})^2} + (1 - \theta) \frac{1}{T\tilde{e}_{i,t-1} - y_{i,t-2}} > 0 \quad (12)$$

and negative if current income is low:

$$\theta \frac{y^L - T\tilde{e}_{i,t}}{(T\tilde{e}_{i,t} - y_{i,t-1})^2} + (1 - \theta) \frac{1}{T\tilde{e}_{i,t-1} - y_{i,t-2}} < 0 \quad (13)$$

Re-arranging equations (12) and (13) yields

$$\frac{(T\tilde{e}_{i,t} - y_{i,t-1})^2}{(T\tilde{e}_{i,t} - y^H)(T\tilde{e}_{i,t-1} - y_{i,t-2})} > \frac{\theta}{(1 - \theta)} \quad (14)$$

and

$$\frac{(T\tilde{e}_{i,t} - y_{i,t-1})^2}{(T\tilde{e}_{i,t} - y^L)(T\tilde{e}_{i,t-1} - y_{i,t-2})} < \frac{\theta}{(1 - \theta)} \quad (15)$$

As $\theta > 0$, $\frac{\theta}{(1-\theta)} > 0$. Adopting the assumption that $y_{i,t-2}$ may be high or low in any of the mobility situations and that individuals may or may not know its value, the following functions for $\tilde{e}_{i,t}$ and $\tilde{e}_{i,t-1}$ satisfy all the above conditions:

$$T\tilde{e}_{i,t} = \max(y_{i,t}, y_{i,t-1})^{(1+\gamma)} \quad (16)$$

$$T\tilde{e}_{i,t-1} = (y^H)^{(1+\gamma)} \quad (17)$$

Equations (16) implies that individuals overestimate their own current effort, assuming that it is high enough for them to deserve at least something slightly higher than their own current and their family's past income. As equation (10), this reflects the notion of entitlement.

Equation (17) implies that individuals overestimate their parents' past effort, assuming that their parents would have deserved something slightly higher than a high income. It should be noted

that, under more restrictive conditions on $y_{i,t-2}$, $T\tilde{e}_{i,t-1}$ can also take lower values than in equation (17).

Additional conditions, on the relation between y^H and y^L and on the size of γ can be imposed to ensure that $\frac{\theta}{(1-\theta)}$ takes a “reasonable” value. For example, one might want to impose that $\frac{\theta}{(1-\theta)}$ is close to 1, which would imply that one’s own experience takes a similar weight as one’s parents’ experience in the formation of perceptions on the importance of effort in determining income.

The theoretical model has shown that the assumption that individuals overestimate their own and their parents’ effort can generate the ranking of perceptions on the importance of income which is observed in the empirical data ($\tilde{\alpha}_{RD} \neq \tilde{\alpha}_{UM} \neq \tilde{\alpha}_{PD} \neq \tilde{\alpha}_{DM}$). The remainder of the paper presents more in-depth empirical analysis in order to demonstrate that the empirical observation is robust beyond the stylized facts presented in section 3.3.

4 Data

I use 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 518 observations of household heads and spouses of household heads from 17 villages in the districts of Dhamtari, Gariyabandh and Raipur. Respondents were interviewed in a baseline survey, several rounds of weekly financial diaries and an endline survey. 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 the 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 sets 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.

4.1 Beliefs on the importance of effort

Beliefs on the importance of effort are measured by a question in which respondents are asked to evaluate whether they consider that effort on the one hand or luck or family background on the other hand is more important in determining why people get ahead, and by how much. I use this variable in my preferred specification, as it asks respondents to weight different determinants of income and closely reflects the relative weight of effort (θ) from the theoretical model. The dataset also contains a question in which respondents are asked whether and to which degree they agree with the statement “The reason why many people are poor is that they put less effort than others”. The main results of my analysis do not hold when using this alternative variable, which may be explained by the fact that it measures the absolute, not the relative importance of effort.

4.2 Income

The dataset includes self-assessed poverty measures for the time of the survey and for 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 are available on a comparable scale for the past and the present, and thus allow to construct coherent mobility measures.

The data also offers the possibility to construct objective weekly income data for different time periods in an interval of 5 months (the financial diaries). To test whether self-assessed income is a good proxy of objective income, I regress the logarithm of weekly household income on a set of dummy variables indicating whether respondents claim they are currently “very poor”, “poor”, “rich” or “very rich” (the baseline category being “neither poor nor rich”). The results are summarized in table 3. The coefficients on “very poor” and “poor” are negative and significant, meaning that those households are indeed poorer than the others. The coefficient on “rich” is positive, but not significant, meaning that those households are not distinguishable from those self-assessed as “neither poor nor rich”. The coefficient on “very rich” is negative and significant; however, there is only one observation of this category, which is why it can be considered an outlier. In sum, the results suggest that self-assessed income is an adequate proxy for objective income.

TABLE 3: Objective and self-assessed income

	(1)	(2)
	ln(weekly household income)	ln(weekly household income)
Very poor	-0.686*** (0.132)	-0.423*** (0.118)
Poor	-0.293*** (0.064)	-0.164*** (0.039)
Rich	0.016 (0.164)	0.142 (0.263)
Very rich	-0.728*** (0.049)	-1.137*** (0.063)
Constant	6.978*** (0.049)	5.615*** (0.305)
Control variables	No	Yes
Observations	518	518

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

4.3 Mobility

Family mobility is based on the self-assessed income variables described above: a respondent’s assessment of his current poverty and of the poverty of his family when he was a child. 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.

These categories correspond to those described in table 1 for the theoretical model.

4.4 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). I use the self-assessment measures in my preferred specification because it reflects the concept of perceived effort (\tilde{e}_i) from the theoretical model.

5 Empirics

5.1 Summary statistics

The data (table 4) contains information from 518 household heads and spouses of household heads (not of the same households). Half of the respondents are male, and half of them are female. 32% of respondents are from a rich dynasty, 26% upwardly mobile, 30% from a poor dynasty and 13% downwardly mobile. 73% of respondents believe that effort is much more important than family background or luck in determining whether people get ahead in life. On a scale between 1 (very little) and 5 (a lot), they assess their own effort as, on average, 3.7. The respondents' average age is 44 years, and they have 3 years of education. 50% of respondents do agriculture on their own fields, while 4% are self-employed, 27% work as agricultural wage laborers, 13% as wage laborers outside agriculture and 2% are salaried. They had an average of 3.6 siblings, and 13% of respondents have some migratory experience.

Table 5 displays the mean of the variables discussed above by mobility category. In demographic terms (age, gender, number of siblings), the different mobility categories closely resemble each other. As discussed in section 3.3, they differ in their perception on the role of effort in determining income. Respondents from different mobility categories resemble each other in terms of self-assessed effort; however, differences emerge once other characteristics are controlled for, as will be discussed in section 5.2. Individuals from rich dynasties have considerably more, and individuals from poor dynasties less education than upwardly or downwardly mobile respondents. This is consistent with the assumptions that access to education is likely to be positively correlated with past family income and that current income is likely to be correlated with educational achievements. Rich individuals are more likely to work on their own farms or be self-employed, while poor individuals are more likely to be engaged in wage labor or salaried work. Individuals from rich dynasties are slightly less likely than others to have migration experience.

TABLE 4: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.
Family: RD	0.315	0.465	0	1
Family: UM	0.257	0.437	0	1
Family: PD	0.297	0.458	0	1
Family: DM	0.131	0.338	0	1
Effort dummy	0.734	0.443	0	1
Self-assessed effort	3.672	1.032	1	5
Male	0.498	0.5	0	1
Age	43.691	12.896	20	80
Education (years)	3.168	3.578	0	15
Self-employed	0.042	0.202	0	1
Agriculture (own)	0.5	0.5	0	1
Agr. wage labor	0.266	0.443	0	1
Non-agr. wage labor	0.127	0.334	0	1
Salaried	0.019	0.138	0	1
Number of siblings	3.643	1.882	0	11
Migrated	0.127	0.334	0	1
N	518			

TABLE 5: Summary statistics by mobility category

Variable	Rich dynasty	Upwardly Mobile	Poor Dynasty	Downwardly Mobile
Effort dummy	0.84	0.729	0.675	0.618
Self-assessed effort	3.706	3.737	3.636	3.544
Male	0.497	0.519	0.5	0.456
Age	45.601	42.534	42.24	44.662
Education (years)	4.276	2.865	2.344	2.971
Self-employed	0.049	0.053	0.039	0.015
Agriculture (own)	0.62	0.586	0.338	0.412
Agr. wage labor	0.153	0.218	0.403	0.324
Non-agr. wage labor	0.092	0.098	0.162	0.191
Salaried	0.018	0.015	0.019	0.029
Number of siblings	3.828	3.571	3.539	3.574
Migrated	0.104	0.143	0.13	0.147
N	163	133	154	68

5.2 Testing the “entitlement” assumption

Before testing the core prediction of the theoretical model that individuals’ perception of the importance of effort differs with their income mobility, I inspect the data on self-assessed effort to verify whether it is consistent with the core assumption of the model. Equation (16) ($T\tilde{e}_{i,t} = \max(y_{it}, y_{it-1})^{(1+\gamma)}$) formalizes the assumption that individuals overestimate their own effort and feel entitled to earn at least a little bit more than their own current and their parents’ past income. If this assumption is correct, we expect individuals who were poor in the past and in the present (such that $\max(y_{it}, y_{it-1}) = y^L$) to perceive their effort as lower than all other mobility groups (for whom $\max(y_{it}, y_{it-1}) = y^H$). To test whether this is in line with the data, I regress self-assessed effort on dummies capturing whether an individual is upwardly mobile, poor, or downwardly mobile (the reference category being individuals from a rich dynasty).

The results are presented in table 6. Column (2) also controls for the perception of the importance of effort in determining income (α_i in the theoretical model), which may increase “true” effort and thus also perceived effort. Column (3) controls for hours worked in the last week, which may be a proxy for “true” effort (although it is subject to overestimation as well, as discussed in the literature review), and column (4) includes both. All specifications include the full set of control variables capturing individual, household and village characteristics. The coefficient on all three mobility dummies is negative. However, only the one for “poor dynasty” is significant. Hence, the assumption that individuals overestimate their effort in response to their own and their parents’ income does not contradict the data. It is of course likely that self-assessed effort is partially driven by actual effort, and that actual effort is not the same across mobility groups. When controlling for hours worked, the best available proxy for actual effort, the size of the coefficient of the poor dynasty dummy decreases significantly. However, another part of the variation between income groups is likely to be driven by the “entitlement” effect captured in equation (16); as otherwise, one would expect the coefficient on downward mobility to be as low or lower than the coefficient on poor dynasty (actual effort is expected to be smaller for DM than for PD, on the one hand because $\alpha_{PD} > \alpha_{DM}$, such that PD individuals are more motivated than DM individuals, and on the other hand, as they achieve, on average, the same outcome despite the fact that DM individuals are likely to have enjoyed some benefit from having a high-income family background (if $\alpha < 1$, $(1 - \alpha)$, the importance of family background in determining income, must be positive (see equation (1)).

TABLE 6: Verifying the entitlement assumption

	(1)	(2)	(3)	(4)
Family: UM	-0.177 (0.203)	-0.140 (0.197)	-0.199 (0.203)	-0.162 (0.198)
Family: PD	-0.263** (0.094)	-0.200* (0.086)	-0.230*** (0.054)	-0.167*** (0.048)
Family: DM	-0.246 (0.390)	-0.182 (0.386)	-0.224 (0.367)	-0.159 (0.365)
Perception of effort		0.330*** (0.043)		0.329*** (0.035)
Hours worked			0.012 (0.006)	0.012* (0.006)
Constant	2.502** (0.963)	2.247* (0.977)	2.271** (0.854)	2.017* (0.874)
Controls	Yes	Yes	Yes	Yes
Observations	518	518	518	518

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

5.3 Mobility and beliefs in the importance of effort

To test whether α_i , the perception of the importance of effort, differs according to individuals' mobility, and whether the difference between them corresponds to the stylized facts and to the predictions of the theoretical model, I run the following logit regression:

$$beliefs_i = \beta_1 \cdot UM_i + \beta_2 \cdot PD_i + \beta_3 \cdot DM_i + \beta_4 \cdot effort_i + \delta \cdot controls_i \quad (18)$$

$beliefs_i$ is a dummy which takes the value 1 when a respondent believes that effort is “much more important” than luck or family background in determining whether people get ahead. UM_i , PD_i and DM_i are dummies capturing whether a person is upwardly mobile, from a poor dynasty, or downwardly mobile, respectively. The baseline category are individuals from a rich dynasty. $effort_i$ captures individuals' self-assessed effort. $controls_i$ is a vector of control variables including gender, age, education, occupational status, number of siblings, migration experience, and village and caste fixed effects. Table 7 reports results without controlling for self-assessed effort, table 8 reports results with this variable.

In all specifications, the coefficients on UM, PD and DM are negative. The absolute value of the coefficient on PD is higher than the one of UM, and the value of the coefficient on DM is higher than both of the others. This finding is in line with the stylized facts and the theoretical model. The significance of coefficients is not uniform across specifications, and the difference between all categories is not always statistically significant, as one can see from the standard errors. While the difference between individuals from rich dynasties and others and the difference between upwardly mobile individuals and others emerges relatively clearly, the difference between poor and downwardly mobile individuals is not statistically significant.

Coefficients on control variables are almost all insignificant. Coefficients on caste and village

fixed effects are not reported here, but they are almost all insignificant as well. The results on the mobility dummies are stable across different model specifications. The coefficient on self-assessed effort, introduced in table 8, is positive and significant in all specifications. Its introduction does not substantially affect the value of the mobility coefficients; however, their significance level decreases.

The positive coefficient on self-assessed effort seems counterintuitive, as, in the theoretical model, the derivative of $\tilde{\alpha}_i$ (equation (6)) with respect to perceived effort $\tilde{e}_{i,t}$ is negative.

$$\frac{\delta \tilde{\alpha}_i}{\tilde{e}_{i,t}} = -T\theta \frac{y_{i,t} - y_{i,t-1}}{(T\tilde{e}_{i,t} - y_{i,t-1})^2} > 0 \quad (19)$$

A potential explanation for this result is reverse causality between the perception of the importance of effort and the “true” effort an individual decides to exert. The higher the perceived importance of effort, the more effort an individual will exert. Through this channel of actual effort, the perceived importance of effort also affects mobility. The risk of reverse causality is partially alleviated once effort is controlled for.

TABLE 7: Mobility and perception of effort

	(1)	(2)	(3)	(4)
Family: UM	-0.671*	-0.758*	-0.726***	-0.715***
	(0.320)	(0.375)	(0.189)	(0.188)
Family: PD	-0.930**	-1.079**	-1.132***	-1.139***
	(0.291)	(0.355)	(0.306)	(0.285)
Family: DM	-1.182***	-1.130**	-1.155**	-1.148**
	(0.326)	(0.384)	(0.414)	(0.410)
Male		0.205	0.135	0.187
		(0.255)	(0.283)	(0.310)
Age		-0.099	-0.096	-0.111*
		(0.059)	(0.054)	(0.052)
Age ²		0.001	0.001	0.001
		(0.001)	(0.001)	(0.001)
Education (years)		-0.001	-0.006	-0.008
		(0.038)	(0.051)	(0.052)
Self-employed			-0.063	-0.102
			(0.564)	(0.505)
Agriculture (own)			0.566	0.501
			(0.715)	(0.706)
Agr. wage labor			0.302	0.212
			(0.703)	(0.750)
Non-agr. wage labor			0.808	0.770
			(0.765)	(0.767)
Salaried			1.519*	1.496*
			(0.595)	(0.626)
Number of siblings				0.165*
				(0.064)
Migrated				-0.084
				(0.294)
Constant	1.662***	3.046	2.335	1.930
	(0.223)	(1.563)	(1.232)	(1.109)
Village F.E.	No	Yes	Yes	Yes
Caste F.E.	No	No	Yes	Yes
Observations	518	518	503	503
Pseudo R^2	0.029	0.068	0.093	0.105

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

TABLE 8: Mobility and perception of effort

	(1)	(2)	(3)	(4)
Family: UM	-0.693*	-0.721	-0.653**	-0.631**
	(0.324)	(0.376)	(0.201)	(0.206)
Family: PD	-0.931**	-1.012**	-1.041***	-1.035***
	(0.299)	(0.360)	(0.265)	(0.245)
Family: DM	-1.158***	-1.095**	-1.090*	-1.071*
	(0.330)	(0.393)	(0.431)	(0.428)
Self-assessed effort	0.308**	0.371**	0.443***	0.447***
	(0.101)	(0.119)	(0.090)	(0.107)
Male		0.133	0.050	0.086
		(0.253)	(0.287)	(0.309)
Age		-0.118	-0.112*	-0.126*
		(0.062)	(0.052)	(0.051)
Age ²		0.001*	0.001	0.001*
		(0.001)	(0.001)	(0.001)
Education (years)		-0.001	-0.002	-0.002
		(0.037)	(0.047)	(0.048)
Self-employed			-0.531	-0.576
			(0.528)	(0.486)
Agriculture (own)			0.237	0.167
			(0.691)	(0.659)
Agr. wage labor			-0.071	-0.175
			(0.680)	(0.711)
Nonagr. wage labor			0.542	0.487
			(0.781)	(0.757)
Salaried			1.244	1.256
			(0.657)	(0.675)
Number of siblings				0.165**
				(0.060)
Migrated				-0.007
				(0.271)
Constant	0.558	1.994	1.213	0.776
	(0.417)	(1.623)	(0.875)	(0.720)
Village F.E.	No	Yes	Yes	Yes
Caste F.E.	No	No	Yes	Yes
Observations	518	518	503	503
Pseudo R^2	0.045	0.085	0.115	0.126

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

6 Conclusion

This paper proposed a theoretical model how individuals form perceptions on the importance of effort in determining income based on their own and their family's experience. The model is able to reproduce a phenomenon observed in the data from rural Chhattisgarh, India, which is that individuals from a rich dynasty perceive effort as more important in determining income than upwardly mobile individuals, while the latter perceive effort as more important than individuals from a poor or downwardly mobile dynasty. The mechanism through which individuals of different mobility background develop different perceptions in the model is through perceived effort. The model assumes that individuals overestimate their own effort in a way which makes them feel entitled to receive at least slightly more than their own current income and their family's past income. Through this channel, individuals' perception of the importance of effort is predicted to differ between mobility categories such as observed in the data.

The practical relevance of this finding is twofold: First, a person's perception of the importance of effort determines how much effort they will exert in reality, which in turn has an impact on their income. Second, this perception can also influence a person's political views, such as attitudes towards redistribution. The idea of "entitlement" may contribute to the study of other, broader phenomena than the narrowly defined perception of the importance of effort.

Besides broadening the scope of the theoretical framework outlined in this paper, a straightforward continuation of the study of the formation of perceptions on effort concerns networks. While this paper has confirmed 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. Future research should thus extend the model and empirics of this paper by attempting to connect the literature on beliefs on inequality to the literature on social learning and testing which reference groups are relevant for the formation of beliefs on the reasons for inequality.

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ABSTRACT

This paper proposes a model how individuals form beliefs on inequality based on their own and their family's experience. A person's income is determined by their effort and family background. Individuals do not know the true importance of effort in this equation, but estimate it based on their own and their family's past experience. They overestimate the effort they furnish in the present and the effort their parents furnished in the past. In particular, they estimate that their own effort justifies earning at least their current income but also their parents' past income, thus feeling entitled to conserve the income level of their family. As a result, individuals' perception of the importance of effort in determining income differs according to their income mobility history. The contribution of the model is to study the formation of beliefs on inequality more closely than the previous literature and to identify a behavioural channel through which income mobility affects individuals' perceptions: the channel of "entitlement". The theoretical model reproduces an empirical phenomenon observed in rural Chhattisgarh, India, namely the way in which individuals' perceptions on the importance of effort vary with their own current and their family's past income.

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