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# Economic Comparison and Group Identity: Lessons from India \*

Xavier Fontaine<sup>†</sup>      Katsunori Yamada<sup>‡</sup>

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## Abstract

The caste system has framed a large part of the recent Indian history. Clear tensions between different castes, as well as low-castes' demands for positive discriminations, have played a central role in India's political and social life. We focus here on the intensity of economic comparison within the caste, and between castes. Our underlying goal is to reach a better understanding of this caste interplay. Relying on an happiness panel data set, we find that economic comparison inside the caste affects well-being negatively. Very interestingly, comparison between "rival" castes is found to decrease well-being even more. This latter finding is consistent with the caste struggles we observe.

**keywords:** Subjective Well-being ; Relative Income ; Identity ; Caste ; India ; Panel Data

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India is a rare example of a large country endowed with a clear social stratification. In this society, identity depends deeply on the caste one has inherited from his parents. Caste belonging largely defines one's position in the social hierarchy. As an important consequence, caste belonging also frames one's position in the income distribution.

At the same time, clear and strong tensions undermine the relations between castes. These tensions actually define a large part of India's social and political life.

Caste thus plays a central role in India. Little is known, however, about the way one compares his own economic situation to the one prevailing in her caste or in the rival castes. Such knowledge seems necessary to properly understand the interactions observed between castes. The present paper precisely aims at clarifying the way economic comparison affects Indians.

We make a joint use of two data sets to investigate the comparison pattern in India. The first one is a 3-years panel conveyed in six of the biggest Indian cities (the "Survey on Preferences toward, and Satisfaction with, Life", hereby Osaka Database). This survey contains an happiness question we will use to investigate respondents' feelings about their co-citizens. The second data set is a huge, representative survey of the Indian population, the NSSO Employment and Unemployment Survey. Using this second data set makes it possible to compute the level of expenditure in the groups our respondent may compare to.

Consistently with the relative income theory, Indians appear to compare to people from their own caste. These comparisons affect their well-being negatively. More importantly, they also compare to people from the "rival" castes (the rival castes of the non-depressed castes being the depressed castes, and vice-versa). These between-castes comparisons actually appear to reduce Indians well-being more than within-caste comparisons do. This strong between-castes comparison pattern increases our understanding of caste interplay we observe.

## 1 Literature

### 1.1 Caste relations in India<sup>1</sup>

#### 1.1.1 Background

Although the caste system is about 3 000 years-old, the interactions between castes plays a central role in the recent Indian history. The caste system divides Indians

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<sup>1</sup>This section substantially draws on Susan Bayly's general survey of the recent history of the Indian caste society (Bayly (2001)).

into four classes (*varna*) and thousands of small communities (*jati*). Caste belonging deeply influences Indians' positions in society (occupation, to whom they can marry or interact with, ...). The caste system actually binds Indians from the lowest castes to be socially and economically segregated.

The post-independence (1947) India has actually defined four broader categories in its first Constitution (1950) for the purpose of affirmative action toward depressed castes. We will rely on this typology during the rest of the paper. First, the *Scheduled Castes* ("untouchables", or *Dalits*) and the *Scheduled Tribes* (the tribals), are considered as "impure" by the Indian caste system. Members of these two groups face important discriminations in their everyday life. For this reason, they have benefited from important quotas in education and administration since the 50s. Above these categories are the *Other Backward Castes*. Even though the castes composing this category are mostly considered as "pure", they are still below the rest of the population in the caste hierarchy. They consequently also suffer from the caste system. The degree to which the Other backward Castes benefit from positive discrimination varies among states. Eventually, the rest of the population is categorised as the *Other*, or non-depressed castes.

Despite strong affirmative action at the federal and state levels, the caste system still shapes income distribution. In terms of per capita household expenditure, Indians from non-depressed castes consume on average 63 % and 46 % more than, respectively, Scheduled Tribes and Scheduled Castes <sup>2</sup>, and 27 % more than the Other Backward Castes. Even in the historically very egalitarian, anti-caste state of Kerala, Deshpande (2000) find caste disparities to drive the overall inequalities.

Given these inequalities and the hierarchical form of the caste system, the fact between-castes relations have been, and still are conflictual is not unexpected. A sizeable part of the last decades political debate has focused on caste-based affirmative action. The Scheduled Castes, Scheduled Tribes and Other Backward Castes have been very active in trying to reduce the economic gap with non-depressed castes <sup>3</sup>. They still struggle to enlarge the scope of positive discriminations they may benefit from. Somewhat paradoxically, this fight has generated some new kind of tensions between castes. The non-depressed population partly fears that these reservation policies could threaten their position in the society, and sometimes adopt strategies to preserve their privileges <sup>4</sup>. Symptomatic of these tensions are the violent conflicts – or "caste wars" – that arise in rural India on a regular basis <sup>5</sup>.

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<sup>2</sup>Authors' computation based on the 2009-2010 round of the National Sample Survey, with a sample size of 570 000 individuals.

<sup>3</sup>Bayly (2001), chapter 7

<sup>4</sup>Bayly (2001), chapter 9, pp. 359-362

<sup>5</sup>Bayly (2001), chapter 9, pp. 342-358 ; Vanden Eynde (2011)

### 1.1.2 Evidences of between-groups comparison

If economic comparison affects well-being, they obviously may affect the way castes interact with each other. Exploring this issue would thus help to understand the relations between castes. We however know quite little on the role played by economic comparison. Building on hypothetical choice experiment, Carlsson et al. (2009) bring some insight on this issue. They asked respondents to choose between several hypothetical societies for their grand-child ; each of these societies was characterised by the levels of income of the grand-child, of the grand-child's caste, and of the whole society. From the answers obtained, the authors elicit the utility function that leads to the choices made.

They find own caste's income to reduce well-being, bringing evidences of negative intra-caste comparison. Keeping own caste's income equal, society's average income affects well-being negatively. When own caste's income is kept constant, society's income variations are precisely variations in the income level of other castes. Carlsson et al.'s result can thus be interpreted as an evidence of between-castes comparison. Very interestingly, the coefficient associated to society's income appear to be bigger than the coefficient associated to own caste income, making the case that Indians compare even more to people from other castes than to people from their own caste.

A few other papers provide evidences of between-group comparison, even though in other countries. Kingdon and Knight (2007) study income comparison in South Africa, and bring evidences about between-races comparison. Jiang et al. (2011) and Akay et al. (2012) focus on the relations between rural-to-urban migrants and urban "natives" in China. Interestingly, all these three papers point out that, whereas within-group comparison affects well-being negatively, between-groups comparison makes people better off. A plausible interpretation for this phenomenon is that the level of income in the other group acts as a signal about one's future income.

## 2 Empirical Strategy

Estimations are conveyed using two databases jointly. The Osaka database is a 3-years panel survey that contains an happiness question, together with socio-demographic and economic information about respondents. In this database, however, we do not have enough data to compute accurate estimates of the median level of expenditure in the reference group. We consequently use an high-quality, huge and representative household survey, the National Sample Survey. Using three waves of this database allows us to compute the reference expenditure level for each year.

## 2.1 Comparison scheme

This paper mostly focuses on within, and between-castes comparisons. Tensions between depressed and non-depressed castes forms the biggest part of the modern caste interplay <sup>6</sup> (see section 1.1). For that reason, we focus on the following between-castes comparison scheme:

- (non-depressed) Other Castes compare to Scheduled Castes, Scheduled Tribes and Other Backward Castes
- Scheduled Castes, Scheduled Tribes and Other Backward Castes compare to the Other Castes

## 2.2 Model specification

Our analysis builds on the three following equations:

$$\begin{aligned}
 SWB_{it} &= a_i + X_{it}\beta + \ln(\text{expenditure})_{it}\beta_{exp} + \ln(\text{within})_{it}\beta_{within} && +\varepsilon_{it} \\
 SWB_{it} &= a_i + X_{it}\beta + \ln(\text{expenditure})_{it}\beta_{exp} && +\ln(\text{between})_{it}\beta_{between} +\varepsilon_{it} \\
 SWB_{it} &= a_i + X_{it}\beta + \ln(\text{expenditure})_{it}\beta_{exp} + \ln(\text{within})_{it}\beta_{within} + \ln(\text{between})_{it}\beta_{between} && +\varepsilon_{it}
 \end{aligned}$$

where  $\ln(\text{expenditure})_{it}$  stands for the natural logarithm of monthly real household expenditure ;  $X_{it}$  stands for a set of socio-demographic characteristics. The individual-specific intercept  $a_i$  accounts for the existence of an idiosyncratic well-being trait.

The variable  $\ln(\text{within})_{it}$  is the logarithm of the median<sup>7</sup> level of real household expenditure of people from  $i$ 's caste who shares his level of education, age, and location. Similarly,  $\ln(\text{between})_{it}$  is the logarithm of the median level of real household expenditure of people belonging to  $i$ 's rival castes, and who shares his level of education, age, and location.

$$\text{within}_{it} = \text{median expenditure}_{it}(\text{city}_i; \text{education}_{it}; \text{age group}_{it}; \text{own caste}_i)$$

$$\text{between}_{it} = \text{median expenditure}_{it}(\text{city}_i; \text{education}_{it}; \text{age group}_{it}; ; \text{rival castes}_i)$$

Using this specification, we actually focus on the way one compare to people similar to him inside his caste, and to people similar to him in the rival castes. We define ‘‘people similar to the respondent’’ as people sharing her age category, educational

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<sup>6</sup>To some extent, however, some Indians from the Other Backward Castes may have seen the Scheduled Tribes as a threat. See Bayly (2001), chapter 9, p.347. Due to the limited size of our sample, this paper sticks to the main picture.

<sup>7</sup>The use of the median, instead of the average, is motivated by its smaller sensitivity to outliers. See for instance Clark et al. (2009)

level and location, following Ferrer-i-Carbonell’s definition of the reference group (2005).

Another possibility would have been to consider that one compares indiscriminately to everyone in each of her reference groups. In this case,  $\text{within}_{it}$  would have simply been the median level of household expenditures in the caste. Remark, however, that the two databases we use distinguish only four castes, leading for instance to only four different values each year for  $\ln(\text{within})_{it}$ . So scarce variations does not allow to identify any significant effect.

Furthermore, one could find doubtful that individuals would compare indiscriminately to everyone in their caste, and indiscriminately to everyone in the rival castes. We cannot test for the validity of such a comparison pattern, but the significance of the results we obtain comfort our specification.

Education is defined along seven categories, from “illiterate” to “graduate and above” (see table 1 for the detail). The population-representative NSS (5.1.2) is used to define three age groups, each containing 1/3 of the adult population of the cities we study. Respondents in the Osaka Database live in six cities: Bangalore, Chennai, Delhi, Hyderabad, Kolkata, Mumbai.

## 2.3 Databases <sup>8</sup>

The analysis is conveyed using two databases jointly. The first one is the “Survey on Preferences toward, and Satisfaction with, Life” (hereby Osaka Database), collected by the Global Center of Excellence program of Osaka University. This survey is a three-years panel collected in six of the ten biggest Indian cities (Delhi, Mumbai, Bangalore, Chennai, Kolkata, and Hyderabad) in January 2009, 2010 and 2011, covering 1.857, 1.283, and 1.000 respondents respectively. Along with socio-demographics questions, the questionnaire contains the following happiness question:

*“Overall, how happy would you say you are currently? Using a scale from 0 - 10 where “10” is “very happy” and “0” is “very unhappy”, how would you rate your current level of happiness ?”*

Given the sample size, computing the median level of expenditure in the reference groups requires the use of an additional database. We thus make use of the NSSO “Employment and Unemployment survey”, a huge, representative household survey of the Indian population. The last two waves of this survey have been collected from July 2007 to June 2008, and from July 2009 to June 2010 respectively (with sample sizes of about 750.000 and 460.000 respectively).

The expenditure variable than can be found informs us about the average monthly household expenditure during the *previous* year. We thus match the

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<sup>8</sup>A lengthier description the databases is provided in annexe.

January 2008 – June 2008, July 2009 – December 2009, and January 2010 – June 2010 monthly household expenditure information from the NSS with the 2009, 2010, and 2011 waves of the NSS respectively. In the six cities we study, the sample sizes of these NSS subsets are 9.712, 6.731 and 6.561 respectively. All our computations are conveyed using the weights provided with the databases. The average number of observations used to compute the median level of household expenditure in the reference group is 32 for the within-caste comparison variable (equation 2.2) and 25 for the between-castes comparison variable (equation 2.2).

## 2.4 Treating the caste variable

The caste variable requires a special attention for two reasons. First, no information about caste membership has been collected during the first of the three waves of the Osaka database. We thus have to extrapolate this information from the next waves of data.

Second, it appears that a sizeable part of the sample have changed his caste belonging from Jan 2010 to Jan 2011 (38% of observations belong to movers). These changes are all the more surprising that they do not occur for other variables such as education, gender etc.. We hypothesise that this change is due to the announcement (May 2010) of the first caste census since 1931. As a depressed caste member, you may suffer from a strong stigma. but you may at the same time benefit from positive discrimination programs (reservation programs). For that reason, you may be willing to manipulate your caste identity, especially when you know that this information is gathered by public institutions. Some respondents may thus have assimilated the Osaka survey with the census, and decided to manipulate their caste statements.

For that reason, we have chosen to impose the restriction that caste membership should be defined as declared during the wave previous to the announcement of the caste census. As a robustness check, we drop all the individuals who changed their caste belonging in the course of the survey (see section 3.3). We obtain the same results with this sub-sample as we do with the whole sample, which comforts our strategy.

## 3 Findings

In a preliminary section, we discuss the coefficients obtained from a simple happiness regression ; we also make use of a comparison variable when the comparison group is not defined accordingly to caste belonging (section 3.1.1). We then study the within and between-castes comparison patterns (3.2). Several robustness

checks are then conveyed (3.3).

## 3.1 General results

### 3.1.1 Baseline regression

Table 1 displays the results obtained in pooled OLS and in fixed-effect OLS when no comparison variable is included. For the sake of clarity, a general comment of the coefficients is left to the annexe.

The impact of caste however deserves some comments. As can be expected, being from the Other Backward Castes instead of being from non-depressed castes (control group) decreases happiness. However, neither being from Scheduled Castes, nor being from Scheduled Tribes has a significant negative impact. This result appears quite puzzling. Interestingly, it is however quite similar to what Linssen et al. (2011) obtain. In rural India, these authors find that belonging to a Scheduled Caste/Tribe or to an Other Backward Caste has no significant impact on well-being, as compared to belonging to a non-depressed caste. Once we control for expenditure and other variables affected by caste discriminations, caste does not appear to affect well-being as much as one could have expected.

### 3.1.2 General comparison

Before turning to within- and between-castes comparisons, we quantify the impact of comparing to similar others. We thus simply consider the reference group as defined by age category  $\times$  education  $\times$  city. The economic theory suggests that seeing similar others getting richer may affect well-being either negatively or positively, if any impact at all. The first idea is an old one (Veblen (1899), Duesenberry (1949)): others' income may increase one's feeling of *relative deprivation*, and thus decreases her well-being. On the opposite, individuals may derive well-being from observing an increase in others' consumption. In an environment characterised by high economic mobility and uncertainty, consumption of others is a valuable information about the level of consumption one can expect for himself. An increase in others' consumption can thus lead to an increase in expectations which, in turn, may trigger positive affects. We thus speak of a *signal* effect. As Hirschman and Rothschild (1973) posited, this signal effect may overwhelm relative deprivation.

Table 2's second column displays the impact of own household expenditures, together with the impact of the reference group household expenditure. The average number of observations used to compute the median level of household expenditure in the reference group is 65.

For comparability purpose, we reproduce in the first column the results obtained when no reference expenditure variable is added to the regression.

Table 1: Happiness regression, no comparison variable

	Pooled OLS		Fixed-effect OLS	
log(household expenditure)	0.505***	0.067	0.351***	0.101
<i>Education (omitted: illiterate)</i>				
literate but schooling < 4 years	0.339	0.275	-0.586	1.172
primary	0.060	0.152	-1.118	2.013
middle/upper primary	0.306***	0.115	-0.644	1.091
secondary/Higher secondary	0.414***	0.115	-0.627	1.195
college, not graduate	0.456***	0.165	0.321	1.801
gradutate +	0.663***	0.131	-0.620	1.426
<i>Labor force status (omitted: employed)</i>				
not working (excl. housewife/husband)	0.547***	0.160	0.639***	0.233
housewife/husband	0.072	0.104	0.242	0.165
retired	0.393***	0.128	0.537***	0.206
student	0.339*	0.179	0.562**	0.269
<i># of children category (omitted: no child)</i>				
1-3	-0.094	0.116	0.067	0.207
> 3	-0.327**	0.149	0.026	0.322
<i>Family Status (omitted: Married Without parents)</i>				
Single without parents	-0.396	0.284	0.045	0.443
Single with parents	0.110	0.178	-0.039	0.256
Married with parents	-0.075	0.081	-0.305**	0.136
Other	-0.111	0.093	-0.157	0.136
<i>Age category (omitted: 18-30)</i>				
31-44	0.022	0.098	0.126	0.273
45+	-0.078	0.099	0.427	0.434
<i>Gender (omitted: male)</i>				
female	0.018	0.097	-	-
<i>City (omitted: Delhi)</i>				
Mumbai	0.497***	0.112	-	-
Bengaluru	-0.747***	0.144	-	-
Chennai	0.166	0.116	-	-
Kolkata	-0.805***	0.109	-	-
Hyderabad	0.108	0.110	-	-
<i>Wave (omitted: 2009)</i>				
2010	0.362***	0.075	0.253***	0.086
2011	0.695***	0.077	0.588***	0.092
<i>Caste (omitted: Other (non-depressed))</i>				
Other Backward Castes	-0.270***	0.089	-	-
Scheduled Castes	-0.031	0.098	-	-
Scheduled Tribes	-0.131	0.133	-	-
Neo-Buddhists	0.119	0.278	-	-
intercept	2.335***	0.603	3.932***	1.326
Num. Obs.	2926		3361	
R-squared	0.1671		0.0418	

\* p<0.10, \*\* p<0.05, \*\*\* p<0.001  
Standard errors in parenthesis.

Table 2: Comparison to similar others - fixed-effect OLS

	Baseline	General comparison
log(household expenditure)	0.351*** (0.101)	0.372*** (0.102)
log(reference expenditure)	-	-0.782*** (0.191)
Num. Obs.	3361	3334
R-Squared	0.0418	0.0508

\* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.001

Standard errors in parenthesis. All controls included.

Similar others' expenditures appear to affect happiness sharply, with a significance level of 1%. Thus, and even though the Osaka survey takes place in six Indian cities experiencing a major economic burst, relative deprivation feelings appear to overwhelm the possible Hirschman signal effect. This result is consistent with what has been found, for instance, in China (Knight and Gunatilaka (2011)), but contrasts with what has been observed in former communists countries during the transition period (Senik 2004, 2008) <sup>9</sup>.

Remarkably, the impact of reference expenditure appears to be way bigger than the impact of own household expenditure. Despite the sizeable standard deviation associated to both estimated coefficients, the difference between the absolute values of the two coefficients is almost significant at a 5% level (p-value associated to the test: .052) <sup>10</sup>.

## 3.2 Within-caste and between-castes comparisons

### 3.2.1 Results

The next step is to separate the previously defined comparison group into two subgroups: those who belong to our caste, and those who belong to the rival caste. For each of these groups, we generate two reference expenditure variables: the within-caste reference variable, and the between-castes reference variable.

Table 3 recalls the general comparison result obtained in the previous sub-section in its first column. In the second and the third columns, we add the within- and between-castes comparison variables separately. In the fourth column, both of

<sup>9</sup>See Clark and Senik (2011) for a general review on the importance of relative deprivation feelings in developing countries.

<sup>10</sup>Remark that the two coefficients are pretty much closer when the regression is performed in pooled OLS (own expenditure: .51 (se: .076), reference expenditure: -.52 (se: .22)). Cf. annexe.

Table 3: Comparison to similar others - fixed-effect OLS

	general comparison	Between-caste comparison	Within-caste comparison	Between-Within comparison
log(household expenditure)	0.372*** (0.102)	0.408*** (0.108)	0.355*** (0.106)	0.410*** (0.111)
log(reference expenditure)	-0.782*** (0.191)	- -	- -	- -
log(Within-caste ref. expenditure)	- -	-0.337*** (0.128)	- -	-0.268** (0.132)
log(Between-caste ref. expenditure)	- -	- -	-0.814*** (0.141)	-0.835*** (0.149)
Num. Obs.	3334	2686	2769	2594
R-Squared	0.0508	0.0442	0.0624	0.0655

\* p<0.10, \*\* p<0.05, \*\*\* p<0.001

Standard errors in parenthesis. All controls included.

them are added to the regression at the same time.

Since the fourth column is based on the most complete specification, we use it as the baseline for our analysis ; the coefficients obtained when putting both the within- and the between-castes comparison variables are however consistent with those obtained in separated regressions (columns 2 & 3).

Comparing to similar people belonging to the same caste affects well-being negatively (5%-level significance). In absolute term, this within-caste comparison has a smaller impact than own expenditure, but this difference is not significant.

Comparing to people from the rival caste appears to have a large negative, 1%-level significant impact on well-being. These Between-castes comparison appears to reduce well-being remarkably more than within-caste comparison (the difference between the two coefficients being significant at a 1% level). Similarly to what has been found when studying the “general” comparison pattern (section 3.1.2), between-castes comparison appears to have a stronger absolute impact than own expenditure (difference test at a 5% level) <sup>11</sup>.

### 3.2.2 Interpreting the results

These results on within/between-castes comparison should be interpreted along several lines. First, they bring evidences of strong between-castes economic com-

<sup>11</sup>In pooled cross-section, the between-caste coefficient is again much bigger than within-caste one. In this setting however, between-caste comparison does not appear to have a bigger absolute impact than own income (see annexe).

parison. Seeing people from the rival castes becoming richer reduces well-being. In such a context, individuals have a strong motives of keeping up with the rival castes <sup>12</sup>. They may even set up strategies to slow down the economic progression of the members of the other castes around them <sup>13</sup>.

Between-castes comparison appears to affect well-being more importantly than within-caste comparisons. We can explain this phenomenon by factors weakening the intensity of comparison inside the caste, and by factors strengthening comparison between castes. Relative deprivation felt toward people from the same caste can be attenuated through several channels <sup>14</sup>. First, some signalling effect within the caste may exist, even though not overwhelming relative deprivation. Within-caste solidarity and insurance may also partly compensate negative feelings associated to economic comparison, not forgetting altruism (or *fellowship feelings*) toward people from the same caste.

The fact between-castes comparison are stronger than within-caste comparisons may also be due to factors intensifying between-groups comparison. The main one is that the economic barrier separating groups is neat in India. To this respect, the results obtained here should be compared to the patterns observed in other countries. As emphasised in section 1.1.2, surveys in China and South Africa have found that while within-group comparisons reduces well-being, between-group comparison increases it. In our setting, however, neat economic barriers separate high-castes from low-castes. Expenditure in the other groups thus cannot serve as a signal about own future outcomes. On the contrary, relative deprivation is even more pandered by the fact people are deeply aware of these barriers.

### 3.3 Robustness checks

Two robustness checks appear to be important to ensure the validity of the previous results. Because some respondents changed their caste membership in the course of the survey (cf. section 2.4), we have to check they are not driving the results. In the annexe, we also remarked that there is an oversampling of Scheduled Tribes. In second check, we run our analysis again without this sub-sample.

We first keep only those individuals we can characterise as non-movers ; that is,

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<sup>12</sup>One can think about the Other Backward Castes' fight for obtaining systemic quotas in education and administration. Symptomatically, the biggest political Indian force (the Congress party) called in 1995 for extending of the reservation principal to job promotions or to recruitment (cf. Bayly (2001), p. 302)

<sup>13</sup>Cf. the rise of the anti-reservation party BJP in the 80s and 90s (Bayly (2001), pp.296-300). Cf. individual level strategies to separate high-caste and low-caste at school or in the housing market (Bayly (2001), pp. 359-362).

<sup>14</sup>We draw here from the rich set of explanations developed by Kingdon and Knight (2007).

Table 4: Robustness - Non-movers, fixed-effect OLS

	Between-caste comparison	Within-caste comparison	Between-Within comparison
log(household expenditure)	0.584*** (0.150)	0.601*** (0.157)	0.598*** (0.157)
log(Intra-caste ref. expenditure)	-0.539** (0.246)	- -	-0.479* (0.272)
log(Inter-caste ref. expenditure)	- -	-0.978*** (0.208)	-0.895*** (0.217)
Num. Obs.	1218	1157	1151
R-Squared	0.0735	0.0975	0.1006

\* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.001

Standard errors in parenthesis. All controls included.

those people we observe until the last wave, and that did not change their caste membership. Table 4 displays the results obtained with this sub-sample. They appear to be perfectly similar to what we have previously found.

We then run the analysis again without the Scheduled Tribes. As can be seen in table 5, our result appear to be also robust to the exclusion of this sub-population.

## 4 Concluding comments

The present study contributes to the literature along two lines. The use of an Indian panel data set first reveals that relevant others' expenditure decreases subjective well-being. This result contrasts with what has been observed in former communists countries during the transition period, but goes in the same direction as those collected in other developing countries. The pattern we observe is especially consistent with what is another big, rapidly growing country: China.

More importantly, this paper brings evidences of strong between-castes comparison. Indians does not only compare to people from their caste, but also to people from "rival" castes. Between-castes comparison actually appears to decrease well-being more than within-caste comparison does. The fact other castes' economic situation matters is important to understand India's economy and society. The level of expenditure of the other castes enters negatively the well-being function, and may thus affect behaviour substantially. In section 3.2.2, we surveyed some cases where caste positional concerns appear to play a significant role.

Going beyond this "depressed / non-depressed castes" comparison scheme would provide a richer picture of this caste interplay. There could well be some rivalry

Table 5: Robustness - Without Scheduled Tribes, fixed-effect OLS

	Between-caste comparison	Within-caste comparison	Between-Within comparison
log(household expenditure)	0.458*** (0.110)	0.473*** (0.110)	0.464*** (0.113)
log(Intra-caste ref. expenditure)	-0.415*** (0.159)	-	-0.328* (0.168)
log(Inter-caste ref. expenditure)	-	-0.839*** (0.145)	-0.846*** (0.151)
Num. Obs.	2567	2527	2475
R-Squared	0.0481	0.0688	0.0703

\* p<0.10, \*\* p<0.05, \*\*\* p<0.001

Standard errors in parenthesis. All controls included.

among low-castes as well, limiting the probability for depressed castes to act together. Due to the limited size of the happiness sample this paper uses, such a more detailed investigation has to be conveyed in future work.

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## 5 Annexe

### 5.1 Data

We provide here a longer description of the two data sets used throughout this article, and compare the basic statistics obtained in the two datasets.

#### 5.1.1 Osaka database

The Global Center of Excellence program of Osaka University has gathered information on individual's happiness, monthly expenditure levels, castes, educational attainments, and so forth in its "Survey on Preferences toward, and Satisfaction with, Life." These panel data have been collected via in-person surveys, covering six of the ten biggest Indian cities ; Delhi, Mumbai, Bangalore, Chennai, Kolkata, and Hyderabad. The survey has been conducted in January 2009, 2010 and 2011, covering 1 857, 1 283, and 1 000 respondents respectively. The number of observations usable for regressions will be smaller due to missing information in survey answers, or due to inconsistent answers across the waves.

The data has been collected accordingly to the following design. Each city has been divided into four areas. From each area, we picked up 15 residential sections randomly. Native investigators have been sent to survey five subjects in each residential sections in face-to-face interview. Investigators were free to chose to which door to knock, but they were required to meet two rules: (i) they could not examine a subject living next to the other subjects, (ii) in the collected data set the distributions of gender and age category should be as designed. Regarding the surveys in 2010 and 2011, interviewers went back to the subjects' places if they had not moved

#### 5.1.2 NSSO Employment and Unemployment survey

The NSSO "Employment and Unemployment survey" is a large, nation-wide and representative survey driven by the NSSO (National Sample Survey Office). This survey is part of a larger survey program, the National Sample Survey, initiated by the Indian government in 1950. This Employment and Unemployment survey takes place roughly every two years.

For the purpose of the present study, we make use of two successive Employment and Unemployment surveys, respectively conducted through the 64th and 66th round of the National Sample Survey. The first took place from July 2007 to June 2008, and the second from July 2009 to June 2010. They collected information on about 570.000 individuals (125.000 households) and 460.000 individuals (100.000) respectively. Even though this is not formally implemented through quarterly

stratification, the sampling is designed to be representative at the quarterly level in areas as big as the cities we have at hand (Imbert and Papp (2011)).

Remark that the 64th and 66th rounds of the NSS both contained also a “Consumer Expenditure survey”. Both the Employment and Unemployment survey and the Consumer Expenditure survey are representative, but the Consumer Expenditure survey also contains detail about each item the household may have consumed. As a counterpart, the size of the sample is considerably smaller (240.000 individuals in 2007-2008 ; 140.000 individuals in 2008-2009) .For that reason, and as detailed data about consumption are not required, we preferred to use the Employment and Unemployment survey.

### 5.1.3 Comparative statistics – NSS and Osaka database

Table 6 compares the ODB and NSS samples with respect to the main population characteristics we are interested in <sup>15</sup>.

The median level of household expenditure is quite similar in both samples. The caste distribution in the Osaka Database appears to be partly imbalanced, with the share of the Scheduled Tribes as a source of concern: they represent 8.33% of the Osaka Database, and 1.26% of the NSS. The distribution of education is not equal in both samples, but there is no clear shift of general education between them. The sample from the Osaka database also appears to be older.

To recover the parameters from the utility function, a perfect representativeness of the sample answering the happiness question is not necessary. The sample used should however resemble the general population reasonably enough to avoid getting a result fallaciously driven by an over-represented sub-population. This is the worry we could have about the Scheduled Tribes, who are clearly over-represented in our sample. For that reason, we test the robustness of our result to the exclusion of these respondents in section 3.3.

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<sup>15</sup>We restrict the NSS sample to individuals matching the Osaka Database restrictions: only people older than 20, and living in one of the 6 cities studied in the ODB. For the sake of simplicity, we compare the ODB with the last wave of the NSS.

In the ODB, the sampling procedure is designed to be random at the city level. The number of individuals drawn in each city is however the same by design. To enforce comparability with the NSS, we thus weight each observation accordingly to the share of its city among the 6 cities the respondents live in.

Table 6: Descriptive statistics, NSS66 &amp; Osaka Database

	NSS 66	Osaka Database
Caste (%)		
Other Backward Castes	30.06	26.39
Scheduled Castes	13.66	15.09
Scheduled Tribes	1.26	8.33
Neo-Buddhists	–	1.42
General Population	55.02	48.77
Education (%)		
Illiterate	12.80	12.84
Literate, formal schooling < 4 years	4.71	1.34
Primary	9.73	6.80
Middle/upper primary	14.73	24.07
Secondary/higher secondary	31.44	31.24
College, but not graduate	1.74	5.91
Graduate and +	24.86	17.81
Age category (%)		
20-30	31.66	18.96
31-44	33.25	32
45+	35.09	49.04
Median household expenditures (real, 2005)	5803	6083

## 5.2 Commenting the usual set of regressors

This subsection comments at length the coefficients obtained in table 1. We will mostly comment the pooled OLS results here, since socio-demographic characteristics hardly vary during a 3-years time span.

As expected, log real household expenditure has a positive and very significant impact. As compared to being illiterate, education improves monotonically well-being.

The case of the labour force status is of interest. Everything being kept equal (household expenditure included), any situation appears to be better than working, except being “housewife or househusband” (97.6% of people belonging to this category being actually women). The difficult working condition in developing countries certainly drive much of this result. Astonishing however is the impact of “not working”: it appears to be widely preferable not to work (without being housewife/husband) than to be a worker. On this topic, it must however be emphasised that this status is not equivalent to the fact of being unemployed, that not working but looking for an occupation. In the Hindi version questionnaire, for instance, this answer literally relates to the fact of not working. Since women are over-represented in this category (70%, while they represent only 52% of the sample), we hypothesised that most of these people are women at the head of the household, with another women doing the housekeeping tasks for her (daughter, daughter-in-law, . . .) ; they thus can declare not to be working, instead of declaring they are housewives. When running this regression separately for men and women, it indeed appears that whereas being "not working" has a significant and positive impact for women, it has a negative insignificant impact for men.

Having between one and three children does not affect happiness, as compared to having no child. Having more than three children, however, significantly decreases happiness. This pattern is pretty similar to the pattern observed in developed countries. The rest of the family status variables surprisingly does not seem to have any significant impact. Age and gender also appear to have no significant impact. On the contrary, both the living place and the year have strong effects on well-being.

## 5.3 Replicating the analysis in pooled OLS

Table 7: Comparison - pooled cross-sectional OLS

	general comparison	Between-caste comparison	Within-caste comparison	Between-Within comparison
log(household expenditure)	0.507*** (0.076)	0.515*** (0.078)	0.520*** (0.080)	0.527*** (0.080)
log(reference expenditure)	-0.516** (0.222)	-	-	-
log(Within-caste ref. expenditure)	-	-0.203** (0.101)	-	-0.184* (0.098)
log(Between-caste ref. expenditure)	-	-	-0.559*** (0.149)	-0.564*** (0.147)
Num. Obs.	2902	2686	2769	2594
R-Squared	0.1710	0.1674	0.1801	0.1796

\* p<0.10, \*\* p<0.05, \*\*\* p<0.001

Standard errors in parenthesis. All controls included. OLS standard errors are clustered by (age category  $\times$  education  $\times$  city  $\times$  caste).