Caste Differences in Intelligence, Education and Earnings in India and Nepal: A Review

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Caste differences in intelligence, education and earnings in India and Nepal are reviewed. The highest caste, Brahmin, had higher intelligence estimated at 4.7 IQ points, as well as higher education and earnings when compared with the lowest castes, known as Dalits, Sudas, or Scheduled Castes.
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There have been five broad castes (varnas) in the Indian subcontinent for around 2,000 years. These castes are ordered in a social status hierarchy. The top are the Brahmins who were traditionally priests and scholars; these are followed by the Kshatriya who were warriors; the Vaishya who were traders, craftsmen and artisans; the Shudra who were peasants and laborers; and finally by the Sudas who traditionally were called Untouchables and more recently are also known as Dalits or Harijans and are officially listed as the "Scheduled Castes".

The castes have been described by Das and Pivato (1976) as follows: "The high caste Brahmin is assumed to have a culture which encourages intellectual development. In contrast, the lowest caste Harijan is not known to have an intellectual tradition. Apart from socio-cultural factors that might favour cognitive growth in the Brahmins, there may be genetic advantages. If one believes in the legend of the origin of the caste system, the Harijans were, to start with, the slaves of the caste Hindus. They were supposed to be inferior in intellect and did the most menial jobs. In contrast, the Brahmin were the interpreters of the religious texts, advisers to the king, and were generally regarded as the source of wisdom".

According to Das and Khurana (1988, p. 488) it is widely believed that the Brahmins, the Kshatriya and the Vaishyas came originally from Central Asia and that they crossed into northern India around 1500 BC, established themselves as the higher castes and prohibited intermarriage with other castes. It is believed that the top three castes were of a lighter skin color than the fourth caste (the Shudra) and the Scheduled Caste untouchables who were the native people conquered and subjugated by the invaders. The theory that the Brahmins entered northern India from Central Asia is consistent with the contemporary population in which Brahmins are 6.6 percent of the total population and are most numerous in the four northern states of Uttarakharand (20 percent), Himachal Pradesh (14 percent), Jammu and Kashmir (11 percent) and Uttar Pradesh (10 percent), and only 1 percent of the population in the southern states of Kerala, Tamil Nadu and Andhra Pradesh (Anon, 2007).

There is some evidence supporting the belief that there are genetic differences between the castes. Thomson and Buxton (1923) reported that the lower castes have broader noses than the higher castes and that this is because they lived in a hot tropical climate where broader noses are adaptive, while the higher castes have narrower noses that are adaptive in the cooler climates in the north-west from which they came. According to the survey of a large number of historical societies by Sorokin (1927, p. 139), the nearest approach to zero mobility and interbreeding across social classes in a society has been the Indian caste system. This would have preserved genetic differences between the castes.

Modern genetic evidence suggests a period between 4,200 and 1,900 years before present when substantial mixture between populations of South Indian and presumed West Eurasian origin took place, followed by a period of caste-based endogamy (Moorjani et al., 2013). Thus all castes have genetic origins from these two sources, but in somewhat different proportions. For example, Moorjani et al. (2013, Table 1) estimated West Eurasian ancestry as 62% for Brahmins in Uttar Pradesh, and 40.5% for Scheduled Castes in Tamil Nadu. David Reich (2018, p. 137) summarized the genetic results for Brahmins and the other castes, referring to West Eurasian ancestry as Ancient North Indians (ANI) to respect political sensibilities in India: "Groups of traditionally higher social status in the Indian caste system typically have a higher proportion of ANI ancestry than those of traditionally lower social status, even within the same state of India where everyone speaks the same language. For example, Brahmins, the priestly caste, tend to have more ANI ancestry than the groups they live among, even those speaking the same language."

Some anthropometric differences between the castes have been reported. Sen, Phulia and Wasnik (1986) investigated whether there were anthropometric

differences between Scheduled Caste and higher caste Indian students in a study of 150 students aged 16-18 years measured for height, leg length, head circumference and weight. The results showed that the higher caste students were higher than the Scheduled Caste students in all measurements. In a further study, Jiloha (2010) reported that children of Scheduled Castes and Scheduled Tribes had higher levels of undernutrition compared to the national average on all three measures: weight-for-age, height-for-age, and weight-for-height. Undernutrition is one possible cause of anthropometric differences between castes.

In this paper we summarize research on caste differences in intelligence, educational attainment and earnings in India and Nepal using the search engines PsycINFO and Web of Science. We found relatively few studies of these and about half of them were published in Indian journals that we were not able to consult because they are not available in western libraries.

Intelligence

Studies of the intelligence of the castes are summarized in Table 1. Row 1 gives verbal reasoning IQs for the four non-scheduled castes in the United Provinces of Agra and Oudh (Lall, 1944). The sample consisted of all those in government high schools aged 11 years and over tested with a verbal reasoning test normed on the 100 ± 15 IQ metric in India. The higher IQ of the Brahmins than of the low-caste Shudras (6.6 IQ points) is statistically significant.

Row 2 gives IQs for four castes in the Lucknow district (Chopra, 1966). IQs were assessed with the Standard Progressive Matrices (SPM) for a sample of 1,193 students with a mean age of 15.5 years randomly selected from alphabetically arranged lists of students in 22 urban and six rural schools. ANOVA showed that the differences in the means for the IQs are statistically significant between the three higher castes and the lowest scheduled caste ($p<.01$).

Row 3 (Das, Jachuck & Panda, 1970) shows the Standard Progressive Matrices (SPM) results of two samples of 118 Brahmin and Harijan children in Orissa with a mean age of 10 years. The Brahmin children obtained an average score of 20.26 and the Harijan children obtained an average score of 18.3. These scores are at the British 1979 standardization percentiles of 8.0 and 6.3 and IQs of 79 and 77, respectively. This study also reported significant ($p<.05$) differences between Brahmins and Harijans on the work-reading speed with Brahmin children faster than Harijan. Row 4 gives results from the same study for a short-term memory task for 9 to 11 year olds showing Brahmins obtained higher scores than Harijans/Sudas.

Row 5 gives IQs for Brahmin and Harijan children (Das & Pivato, 1976) assessed with the Coloured Progressive Matrices (CPM). This study compared 360 Brahmin and Harijan children aged 10 years in Orissa. Brahmins scored 17.7 on the CPM (6th percentile on the British 1982 standardization, IQ 76.5). Harijans scored 16.45 on the CPM (4th percentile on the British 1982 standardization, IQ 73.7). These British IQs are not adjusted for Flynn effect increases for which 1.5 should be added.

Row 6 gives IQs assessed with the Coloured Progressive Matrices for Brahmins and Kshatriya (combined) who obtained British IQs of 75 and for Vaisyas and Shudras (combined) who obtained British IQs of 66 (Ghuman, 1978).

Row 7 gives IQs for Vaisya and Sudas assessed with the Standard Progressive Matrices giving British IQs of 89 and 74, statistically significant at $p<.01$, respectively (Gaur & Sen, 1989).

Rows 8 and 9 give Digit Span Forward (DS-F) results for Brahmin and Sudas 6-7 and 7-8 year olds showing higher scores by the Brahmin (Das, 1994). Also given were tests of free recall and serial recall. Brahmins scored significantly higher than Sudas at $p<.001$ on all tests.

Table 1. *Studies of the IQs of the castes in India.*

	N	Age	Test	Brahmin	Kshatriya	Vaisya	Shudra	Scheduled	Reference
1	1030	11+	VR	102	101.1	99.4	95.4	-	Lall, 1944
2	1193	15	SPM	87	89	92	-	82	Chopra, 1966
3	236	10	SPM	79	-	-	-	77	Das, Jachuck & Panda, 1970
4	118	9	STM	5.54	-	-	-	4.25	Das, Jachuck & Panda, 1970
5	360	10	CPM	76.5	-	-	-	73.7	Das & Pivato, 1976
6	96	10	CPM	75		66		66	Ghuman, 1978
7	200	12	SPM	-	-	89	-	74	Gaur & Sen, 1989
8	60	6/7	DS-F	4.85	-	-	-	4.36	Das, 1994
9	60	7/8	DS-F	5.66	-	-	-	4.56	Das, 1994

Notes: SPM = Standard Progressive Matrices; CPM = Coloured Progressive Matrices; VR = Verbal reasoning; STM = Short-term memory; DS-F = Digit Span Forward.

In addition to the studies summarized in Table 1, Agrawal and Mishra (1983) reported a study of the cognitive abilities of 60 Scheduled and 60 non-Scheduled castes of children aged 8-13 years in the city of Varanasi. The task consisted of learning 16 words and was scored for the number of trials needed to complete the task. The Scheduled Castes children needed significantly more trials (*p*<.05).

In a more recent longitudinal study drawing data from children's cognitive abilities using the Young Lives study, Bóo (2009) reported cognitive abilities in relation to socioeconomic influences for three groups: Scheduled Castes (including Scheduled Tribes), other backward castes (including Muslims), and upper castes. This study consists of two cohorts of children surveyed over two rounds collected from Andhra Pradesh. In Round 1, 2,000 children aged around 1 (the Younger Cohort) and 1,000 children aged around 8 (the Older Cohort) were surveyed in 2002. Round 2 tested the same children in 2006 at age 5 and 12, respectively (apart from the attrition rate of 0.9 per cent). The sample of children is representative of the three regions of Andhra Pradesh: Rayalaseema, Coastal Andhra and Telangana. The cognitive tests included Raven's Coloured Progressive Matrices (CPM), Peabody Picture Vocabulary Test (PPVT), Cognitive Development Assessment (CDA), and reading level and writing level tests.

The three groups labelled 'Other Castes' or 'Upper Castes' consist mainly of 'forward castes' who enjoy a more privileged socioeconomic status than Scheduled Castes (SCs) and Scheduled Tribes (STs). In rural Andhra Pradesh, SC colonies are in most cases located separately, away from the main villages. These colonies are named after the caste and even in the official records are often called *harijana wada* (or Dalit colonies). They have been subjected to discrimination for centuries and therefore had no access to basic services, including education. STs are the indigenous people, generally living in forests. Backward Classes (BCs) are people belonging to a group of castes who are considered to be backward.

Young Lives survey data and questionnaires are publicly archived with the UK Data Service. Among a set of cognitive tests used in the older cohort was the Coloured Progressive Matrices (CPM) test (Raven, 2008), administered in 2002 when the children were 8 years old. The IQs are Flynn effect corrected because British IQs increased from 1982 to 2007 by 3.2 IQ points per decade (Lynn, 2009). Thus, the British IQ in 2002 was 1.6 points lower than in 2007 and this figure needs to be added to the British IQs to equate the samples for the same year (2002).

Table 2 shows the means, standard deviations and standardized group differences (Cohen's *d*) of three caste groups on a set of cognitive test scores in these two cohorts collected in 2002, 2006 and 2009.

This study shows that at age 5 in the younger cohort, the upper castes have higher average IQs than the Scheduled Castes of 6.3 IQ points on the Cognitive Development Assessment (CDA) test, and of 4.2 IQ points on the Peabody Picture Vocabulary Test (PPVT) calculated from Cohen's *d*. The difference on the Coloured Progressive Matrices in the older cohort is approximately 6.5 IQ points

based on the standard deviations of the Young Lives sample, or 7.8 points based on British scaling. Differences of similar magnitude are observed on the other test administrations.

Table 2. *Means, standard deviations (SD), and standardized group differences (Cohen's d) for children's cognitive abilities by caste, from the Young Lives study. The British-scaled IQs for the CPM are Flynn effect corrected.*

Cohort, year	Age	N	Test	SC Mean ± SD	OBC Mean ± SD	UC Mean ± SD	d SC-OBC	SC-UC
Younger, 2006	5	1924	CDA	9.09 ± 2.63	9.26 ± 2.57	10.16 ± 2.49	.07	.42***
Younger, 2006	5	1848	PPVT	27.29 ± 22.28	24.89 ± 18.88	33.66 ± 23.01	-.12*	.28***
Younger, 2009	8	1897	PPVT	53.97 ± 27.32	57.15 ± 29.28	68.46 ± 35.14	.11*	.46***
Younger, 2009	8	1900	Math	10.28 ± 6.26	12.22 ± 6.22	14.18 ± 6.35	.31***	.62***
Older, 2002	8	1003	CPM British IQ	22.23 ± 5.17 78.85	22.89 ± 5.28 81.15	24.48 ± 5.39 86.67	.13 -	.43*** -
Older, 2006	12	971	PPVT	89.33 ± 24.96	88.22 ± 24.94	96.07 ± 20.55	-.04	.30***
Older, 2006	12	980	Math	5.53 ± 2.41	5.64 ± 2.29	6.26 ± 1.83	.05	.34***

Note: SC = Scheduled Castes (including Scheduled Tribes), OBC = Other Backward Castes (including Muslims), UC = Upper Castes. CDA = Cognitive Development Assessment, CPM = Raven's Coloured Progressive Matrices, PPVT = Peabody Picture Vocabulary test. * p<.05; *** p<.001.

Educational attainment and earnings

Studies of the educational attainment and earnings of Brahmins and Scheduled Castes in India and Nepal are summarized in Table 3. Rows 1, 2 and 3 (Borooah, 2012) give results from the Indian Human Development Survey of 2005 showing that Brahmins had completed an average of seven years of education while the Scheduled Castes had completed an average of four years. 39% of Brahmins and 13% of Scheduled had a 'matric' examination qualification, and 14% of Brahmins and 2% of the Scheduled Castes were university graduates.

Rows 4, 5 and 6 (Karki & Bohara, 2014) give results for Nepal, where Brahmins are 28.9 percent of the population and the Scheduled Caste are 6.7 percent of the population. The data come from a 1998-9 survey of employed 18-65 year olds and show Brahmins had more years of education, much higher literacy rates, and greater percentages with college degrees than the Scheduled Caste. Rows 7 and 8 give results from the same 1998-9 survey in Nepal showing

Brahmins had higher average monthly earnings in rupees and lower percentages in poverty than the Scheduled Caste.

Table 3. *Educational attainment and earnings of Brahmins and Scheduled Castes.*

	Country	N	Measure	Brahmins	Scheduled	Reference
1	India	12300	Education, years	7	4	Borooah, 2012
2	India	12300	Matric, %	39	13	Borooah, 2012
3	India	12300	Degrees, %	14	2	Borooah, 2012
4	Nepal	6466	Education, years	10.2	5.6	Karki & Bohara, 2014
5	Nepal	6466	Literacy, %	90.2	42.0	Karki & Bohara, 2014
6	Nepal	6466	Degrees, %	26	1	Karki & Bohara, 2014
7	Nepal	6466	Monthly earnings	3495	2088	Karki & Bohara, 2014
8	Nepal	6466	Poverty, %	18	46	Karki & Bohara, 2014

Other studies have shown poorer nutritional state and higher rates of child stunting among children of the Scheduled Castes and Scheduled Tribes (Mukhopadhay, 2015), and their higher rates of crime compared with children of the other castes (Sharma, 2015).

Discussion

There are six points of interest in this review. First, all the studies show that Brahmins obtained higher average IQs and educational attainment and earnings than the Scheduled Castes in India and Nepal. There are four results for the Progressive Matrices measures of intelligence given in Table 1 showing higher IQs obtained by Brahmins of 5 (row 2), 2 (row 3), 2.8 (row 5) and 9 (row 6) IQ points, giving a mean of 4.7 IQ points.

Second, the Brahmins obtained higher average IQs than the other castes shown in Table 1, rows 1 and 6, but not in row 2 where they obtained lower IQs than the Kshatriya and the Vaisya. Thus, in two of the three studies the Brahmins obtained a higher IQ than the other castes but the result in row 2 is anomalous. The Kshatriya and the Vaisya obtained higher average IQs than the Scheduled Castes shown in rows 2 and 7 although not in row 6 of Table 1 where the Vaisya obtained the same average IQs as the Scheduled Castes. These are inconclusive results.

Third, we suggest that the only definitive conclusion that can be drawn from this review is that the Brahmins have a higher average IQ than the Scheduled Castes of which the best estimate is an advantage of 4.7 IQ points as the average of the four studies of the Progressive Matrices given in Table 1. Although large

enough to be of some real-world importance, this difference is of rather moderate size.

Fourth, this estimate is supported by the results of the more recent Young Lives study in Table 2 showing that the upper castes have higher average IQs than the Scheduled Castes of 5.1 IQ points for the 5-year-olds on the Cognitive Development Assessment and of 6.5 or 7.8 IQ points for the older cohort on the Coloured Progressive Matrices.

Fifth, the higher average IQ of Brahmins than of the Scheduled Castes is consistent with their higher educational attainment and earnings in India and Nepal shown in Table 3 and also with their over-representation in the Indian parliament at 9.17 percent compared with their percentage of 5.6 percent in the population (Anon, 2007).

Sixth, we suggest that no definitive conclusions about causal mechanisms are possible at this time. Anthropometric studies indicate more malnutrition among the lower castes than the upper castes (Jiloha, 2010; Sen, Phulia & Wasnik, 1986), and this is supported by the lower earnings and higher poverty rate of the lower castes (Table 3). Malnutrition is a possible reason for the observed differences of the cognitive level (Lynn, 1990), and thereby indirectly of educational attainment and wealth. It is not possible to decide to what extent different socio-economic outcomes of the castes can be attributed to social marginalization, malnutrition, or genetic differences.

Seventh, the results for the Coloured Progressive Matrices given for 8-year-olds in Table 2 show that the upper castes obtained a British-scaled IQ of 86.67 and the Scheduled Castes obtained a British IQ of 78.15. These can be averaged to 82.41 to give a rough estimate of the average IQ for India—or at least for Andhra Pradesh, where the sample was recruited. This confirms the IQ of 82.6 for India given in the compilation of IQs for all nations in the world by Lynn and Vanhanen (2012).

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