Language and Thought (An Insight through Hindi)

Sumit Verma (Y9605) | Mentor: Dr. Amitabha Mukerjee, Dr. Achla M Raina IIT Kanpur

November 15, 2011

Abstract

Does the Language that we speak, affect the way we perceive the world? This question has been under debate for a long time now and has seen the work of several cognitive linguists ranging from Benjamin Whorf to Lera Boroditsky. The present work looks at two aspects of Language i.e. word order and grammatical gender and as to how they play/do not play a role in influencing the way we think about the world. The first part of the work focuses on word order (i.e. SVO/SOV distinction) in Language. A non verbal motion experiment was performed on native Hindi speakers (Mess workers form Hall V IITK) which is primarily a SOV language and on native English speakers (using Amazon Mechanical Turk) which is primarily a SVO language. Results showed that irrespective of whether your native language is SVO or SOV in nature, SOV is the preferred order while performing pictorial motion tasks. In the second part of the work, grammatical gender differences between Bihari Hindi and Standard Hindi were looked at. Hindi in general does not have any separate classification for the neutral gender. In Bihari Hindi, most of the neutral words are considered to be masculine whereas in Standard Hindi, there is a specific set of rules to define the gender of a neutral object. A visual experiment was done on native Bihari Hindi Speakers and native Standard Hindi speakers, using words which were masculine in Bihari Hindi but feminine in Standard Hindi. Results showed that participants notion about the word was influenced by its gender in the participant's language, thereby demonstrating the effect of grammatical gender on one's perception.

1) Introduction

For the past three decades, a lot of philosophers and cognitive researchers have been debating over the issue as to whether the language that we use determines our thoughts, perception, the way we see the world etc. or not. Some of the pioneers in this field were people like Humboldt (1836) (believed that you cannot separate language and thought) and Benjamin Lee Whorf (Founder of the famous school of thought "Whorfianism") to name a few.

A definition about the original version of the Whorfian hypothesis from Wikipedia reads:-

"It is the idea that differences in the way languages encode cultural and cognitive categories, affect the way people think, so that speakers of different languages think and behave differently because of it." [5]

This strong version was rejected after some critical study regarding color perception and emotion display was done. However a softer version of the hypothesis was then considered.

In simple words, the softer version of the hypothesis claims basically two ideas:-

1] Languages vary in their view of the world and of abstract entities like time, space etc. which can influence how a person thinks.

2] Semantics/Structure of a language may also influence the way a person perceives the world.

The first claim was demonstrated by a work of Lera Boroditsky [6] wherein she demonstrated how English and Mandarin speakers talk very differently about time. English basically treats time to be horizontal in nature (words like before/after are used to describe events) whereas Mandarin treats it to be vertical (words like shang (up) and xia (down) are used to describe sequence of events). Through a set of experiments, she was able to show that Chinese speakers did think of time to be vertical even when they were using English sentences. The present work looks more at the second claim and tries to demonstrate whether or not the claim is valid.

2) Motivation and Background

The first part of the work focuses on word order in language and its influence on the way people belonging to different cultures of the world, perceive/act differently to the same task.

Majority of the languages in the world follow either the Subject-Verb-Object (SVO) sequence or the Subject-Object-Verb (SOV) sequence. English for example is primarily a SVO language. SVO sentences like – Donald Duck kicked the ball, Rachel is reading a book, are more common and acceptable whereas SOV descriptions of the same event such as Donald Duck ball kicked and Rachel book reading are semantically/syntactically not acceptable.

Hindi on the other hand is more of a SOV language. Most of the sentences in Hindi are like राह्ल

```
ने गेंद मारी|, सीता किताब पढ़ रही है|
```

My claim was that this difference in the structure of language between Hindi and English may have implications on the way people think and reciprocate incidents/events happening in front of them in the world.

The second part of the work focuses on how grammatical gender differences between languages have an influence on the way people think about different concepts [3]. The work was done taking into account the difference between Bihari Hindi and Standard Hindi. Hindi in general does not have the neuter gender. It consists only of the masculine and the feminine gender. As a consequence of this and the social diversity in India, different variations of Hindi have evolved. Standard Hindi has a set of rules which determine whether a particular neutral object is masculine or feminine. On the other hand Bihari Hindi invariably treats most of the neutral

objects as masculine. For example – key (चाबी) is considered to be masculine in Bihari Hindi whereas it is feminine in Standard Hindi. Same is the case with rain (बारिश). So in Bihari Hindi – "गाड़ी आ रहा है।" would be a perfectly correct sentence whereas in Standard Hindi, the correct version would be – "गाड़ी आ रही है।". A similar previous work on grammatical gender difference between Spanish and German speakers by Boroditsky [3] showed that this kind of variation between languages influence the way in which different speakers think differently. This work aims at extending Boroditsky's work to differences between Bihari Hindi and Standard Hindi speakers.

3) Part A – Structure of a Language Influence on Thought

In order to see, whether the word order of a particular language influences one's thinking process or not, a pictorial motion task experiment was done on native Hindi speakers and native English i.e. American Speakers. The initial proposed hypothesis was that since language is a way of expressing one's inner mental activities, English and Hindi speakers would respond differently to the test. The experiment was inspired from [4].

Methodology

Participants:

8 native Hindi speakers were drawn from the Hall V Mess (see appendix A for exact details). On the native English side, the experiment was done using Amazon Mechanical Turk HIT's (Human Intelligence Tasks) in which 21 Americans participated.

Procedure:

• English Speakers: Each Participant was given two sets of images having a subject/object/verb image and they were asked to arrange them so as to give them meaning.

A sample screenshot of the test given to them is as follows:



• **Hindi Speakers:** For this set of participants, the first image set was the same but; the second image (containing Donald Duck) was replaced with that of a person cleaning the floor. This was done because, the participants involved in this set were not very aware of who Donald Duck was and thus in order to prevent another variable from entering into the experiment, the set was replaced with this one.



Results:

Going by the hypothesis, Hindi speakers should have chosen the sequence of the pictures to be SOV, and the English speakers SVO but a rather contrary result came up.

Total number of Hindi tests conducted => 8*2 = 16Total number of English tests conducted => 21*2 = 42



		English Speakers (out of 21)	Hindi Speakers (out of 8)
Pic 1	SOV	17	5
	SVO	0	0
	Others	4	3
Pic 2	SOV	13	6
	SVO	4	0
	Others	4	2

Analysis:

- From the data collected, it is quite evident that the word order of a language does not influence the way people perform other fundamental pictorial tasks (against the hypothesis) as both the English and the Hindi speakers chose to go with the SOV order even though their native languages preferred different word orders. One reason behind this maybe the sequence SOV being more common sensical in nature.
- Another important observation which can be made is that SOV is the more favored word order when it comes to performing motion based pictorial tasks. This result agrees with the result as proposed by Marieke Schouwstra [4].
- It can also be concluded from the experiment that pictorial representation of events is much more fundamental to a human than any other language he/she uses and thus it is more or less uniform across societies and languages.

4) Part B – Influence of Grammatical Gender on Thought

In the year 2003, Boroditsky and her co workers did a grammatical gender experiment on Spanish and German speakers. The word "key" is masculine in German and feminine in Spanish. When the German speakers were asked to describe the word "key" using adjectives, they came up with more masculine like words such as "hard", "jagged", "metal", "serrated" etc. whereas on the other hand Spanish speakers came up with more feminist descriptions like "golden", "shiny", "intricate" etc.

Going on the similar lines, the present work tries to see if grammatical gender has any influence on the different types of Hindi speaking people in India. As mentioned earlier, there is a gender based difference between Bihari Hindi and Standard Hindi. The experiment was formulated so as to bring out this disparity and see its influence on our thought process.

Methodology

Participants

The participants were 10 1st year IITK students from Bihar forming the set of Bihari Hindi speakers and 10 other IITK students from UP, MP, Rajasthan, Delhi forming the other set of Standard Hindi speakers (other relevant details attached in Appendix B,C). For the Bihari Hindi set, only 1st year students were chosen because of the fact that it was seen that senior students get conditioned/accustomed to speaking Standard Hindi after spending a year in the IITK campus. As a result of this, interference may take place while they are performing their experiments.

Procedure

As a first step of the procedure, 2 Bihari Hindi speakers and 2 Standard Hindi speakers were asked to describe the words "चाबी" and "बारिश" using adjectives. After this 3 other hindi

speakers were asked to classify the adjectives into masculine/feminine. It was observed (as per the prediction) that Bihari Hindi speakers gave more masculine adjectives than the Standard Hindi speakers.

The classified adjectives were then arranged so as to form to sets of pictures. The picture sets are as follows:

• बारिश



It may also be noted that the masculine version of the adjectives (e.g. सुनहरा instead of सुनहरी) were used on the picture set (even in case of the feminine picture) so as to prevent biasness towards the female picture sets thus eliminating an extra variable from the experiment.

The participants were then asked to choose one image out of the two which according to them best described the words चाबी and बारिश.

Results

The results obtained were much like that expected. Grammatical Gender seemed to play a role in determining the notion of a person regarding objects that are neutral in gender.

The collected data are as follows:-

		Bihari Hindi	Standard Hindi	
		Speakers	Speakers	
Picture	Pic 1	6	2	
Set 1	Pic 2	4	8	
Picture	Pic 1	7	4	
Set 2	Pic 1	3	6	



Analysis:

- The results obtained in this experiment are consistent with Boroditsky's work with Spanish and German speakers. What is even more surprising is the fact that how variations within the same language (depending on the region) can lead to such differences in ideas.
- If the graph obtained is seen properly, it can be seen that in case of Standard Hindi speakers, there was a drop in the feminine description for the key case. When some of the dummy participants were asked about it (on whom practice tests were done to check the flaws), they said that the descriptions were equally footed in terms of the extent to which they described the word "key", therefore it was very difficult to pick up a single picture between the two.

5) Future Work

The results obtained from this experiment are pretty interesting in nature. In order to consolidate the ideas more the experiment needs to be done on a greater sample set of people

which must include students outside of IITK as well and from rural Bihar. IITK students do not form a randomized set as they are people of similar nature.

Another important observation made while discussing the experiment was the effect of the gender of the participant while doing the experiment. The participants in this work were all males. But as pointed out by some of the participants, the effect could have been different if more females would have participated in the experiment.

6) Conclusion

The work was started with the hypothesis of showing that both word order and grammatical gender influence the way a person thinks about the world. But as the results say, word order is not a factor in influencing our thought. In fact SOV is the preferred word order amongst different languages as it is more common sensical in nature.

On the other hand grammatical gender was found to be influencing the way we think about different objects even in different variations of the same language.

7) References

[1] http://edge.org/3rd_culture/boroditsky09/boroditsky09_index.html (last date of access - 14/11/2011)

[2] Boroditsky, L. (2003). Linguistic Relativity. In Nadel, L. (Ed.) Encyclopedia of Cognitive Science. MacMillan Press: London, UK, pages 917-921.

[3] Boroditsky, L., Schmidt, L., & Phillips, W. (2003). Sex, Syntax, and Semantics. In Gentner & Goldin-Meadow (Eds.,) Language in Mind: Advances in the study of Language and Cognition.

[4] Semantic structure in improvised communication, (CogSci2011) - Marieke Schouwstra, et. al (Anouschka van Leeuwen, Nicky Marien, Marianne Smit, Henri'ette de Swart)

[5] http://en.wikipedia.org/wiki/Linguistics (Last date of access - 14/11/2011)

[6] "Does Language Shape Thought? Mandarin and English Speakers' Conceptions of Time" - Lera Boroditsky, Cognitive Psychology 43, 1-22 (2001)

Appendix A

Profile Data of Hall V Mess Workers

	Language(s) spoken in first 5 years	Parent's mother tongues	Where they lived the first 5 years, and beyond	Schooling in Hindi till what class	Profession	
Participant 1	Hindi	Hindi	Rae Bareli	10th grade	Cook	
Participant 2	Hindi	Hindi	Rae Bareli	10th grade	Mess Worker	
Participant 3	Hindi	Hindi	Gorakhpur	10th grade	Mess Worker	
Participant 4	Hindi	Hindi	Gorakhpur	10th grade	Mess Worker	
Participant 5	Hindi	Hindi	Rae Bareli	10th grade	Mess Worker	
Participant 6	Hindi	Hindi	Nankari, Kanpur	Did not study at all	Sweeper	
Participant 7	Hindi	Hindi	Nankari, Kanpur	Did not study at all	Sweeper	
Participant 8 Hindi		Hindi	Nankari, Kanpur	8th grade	Washerman	

Appendix B

Profile Data of Bihari Hindi Speakers

	Language(s) spoken in first 5 years	Parent's mother tongues	Where they lived the first 5 years, and beyond	Schooling in Hindi till what class
Participant 1	Hindi, Maithili	Hindi, Maithili	Madhubani, Bihar	10th grade
Participant 2	Hindi	Hindi	Hajipur, Bihar	10th grade
Participant 3	Hindi	Hindi	Gaya, Bihar	10th grade
Participant 4	Hindi	Hindi	Silao, Bihar	12th grade
Participant 5	Hindi	Hindi	Patna, Bihar	10th grade
Participant 6	Hindi	Hindi	Tarapur, Bihar	10th grade
Participant 7	Hindi	Hindi	Patna, Bihar	10th grade
Participant 8	Hindi	Hindi	Motihari, Bihar	12th grade
Participant 9	Hindi	Hindi	Patna City, Bihar	10th grade
Participant 10	Hindi	Hindi	Katihar, Bihar	10th grade

Appendix C

Profile Data of Standard Hindi Speakers

	Language(s) spoken in first 5 years	Parent's mother tongues	Where they lived the first 5 years, and beyond	Schooling in Hindi till what class
Participant 1	Hindi	Hindi	Bundi, Rajasthan	12 th grade
Participant 2	Hindi	Hindi	Alwar, Rajasthan	10 th grade
Participant 3	Hindi	Hindi	Kanpur, UP	10 th grade
Participant 4	Hindi	Hindi	Mount Abu, Rajasthan	10 th grade
Participant 5	Hindi	Hindi	Ghaziabad, Delhi	10 th grade
Participant 6	Hindi	Hindi	Noida, Delhi	10 th grade
Participant 7	Hindi	Hindi	Jabalpur, MP	10 th grade
Participant 8	Hindi	Hindi	Lucknow, UP	10 th grade
Participant 9	Hindi	Hindi	Varanasi, UP	10 th grade
Participant 10	Hindi	Hindi	Bhopal, MP	10 th grade