The Semantics of Haroti Post-positional - Interrogating Simple Sentences

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What is Dealt with in This Paper?

My aim in this paper is to work on the spatial cognition in Haroti. This paper finds its root in artificial intelligence. The basic inquiry that shapes this work is: "How can one produce and interpret locative expressions that are appropriate in a given context?"

This paper will present an analysis of semantics and pragmatics of locative expressions like:

1. *Kittab   mej   pa   rakhi   che*
   Book   table   on   put   is
   The book is on the table.

The paper will examine the possibility of constructing a computational model of comprehension and production in the spatial domain.

Keywords: Artificial intelligence, Cognition, Locative, Semantics, Pragmatics, Computational model, etc.

Haroti

Haroti is the name of the southern region of Rajasthan in India. This region has four districts namely Kota, Jhalawar, Bundi and Baran (See Appendix – i). The main aim of this paper is to demonstrate the play of locative expressions in Haroti. A locative expression is a SOV language and locative expressions occur post – positional. As in :

2. *Piisa   ke   adhar   katori   rakhii   che*
   Coin   on   bowl   put   is
      The bowl is on the coin.

Here the interesting element is that *"Ke adhar"* (on) is made of two different locatives lexicons but it gives the sense of one locative that is 'on' as translated into English. Contrary to SOV languages like English where a locative expression modifies the following phrase, in Haroti a locative expression works as post-modifier.

Keeping in mind how people can produce and interpret locative expressions that are appropriate in a given context, the data in the paper mainly focus on these questions:

   (i)   How do people manage to produce and interpret locatives?

         (i-a) Do the locative phrase, and the locative phrase in a sentence give the same interpretations, or they vary?

         (i-b) Why do certain locative phrases come as a null phrase, and other get full expression?

   (ii)   What is the possible syntax semantics interface in the construction of locatives?

The Status of Awareness of Computing Situations

As we know in human language processing, our brain computes the performance which works out in a given context. To prove the accountability of a given performance, the question how the acquired knowledge is put to use is crucially important.

A human compute system works on the following terms: How we take in the observe data, process it, and work out for actual use, given various contexts. Before giving an explanation to the problem: What are the relevant brain mechanisms for spatial cognition? It would be appropriate to suggest that in general conversation we are not aware of computation consciously.

This can be shown by giving a native speaker of Haroti the following sentences: For example:

3. *Pen   kittab   ma   che*
   Pen   book   in   is
   The pen is in the book.

The speaker is cognizant of one situation that the book is closed and the pen is inside the book. He cannot say that the book is open, and the pen is in it, in Haroti. For this interpretation he will use different locative expressions like 'pƏ' and the sentence would become:

4. *Pen   kittab   pƏ   che.*
   Pen   book   on   is.
   The pen is on the book.

The sentence (4) helps him to cognize two different situations –

   a.   The book is closed and the pen is on the book.

b. The book is open and the pen is on it.

This clarity has come out because locative expressions occur in the sentence. If they were used in the phrase:

5. *kittab*　mƏ　*pen*
　Book　**in**　**pen.**
　The pen (is) in the book.

Or

6. *kittab*　*pƏ*　*pen.*
　Book　**on**　**pen.**
　The pen (is) on the book.

Location of the Meaning of Locative Expression

The native speaker is not able to comprehend the various interpretations if they were used in phrases. This proves that locative expressions find their meaning in sentences. Though we acquire a language in phrases yet we comprehend it in sentences. Hence syntax finds its expression in pragmatics.

Postpositional Meanings

From the above example an interesting thing comes into light that verbal element adds clarity to the sentence, and provides various interpretations. Now the question arises whether verbal element entails the postpositional meaning or postpositions find their meaning in the sentence. Let's take two examples:
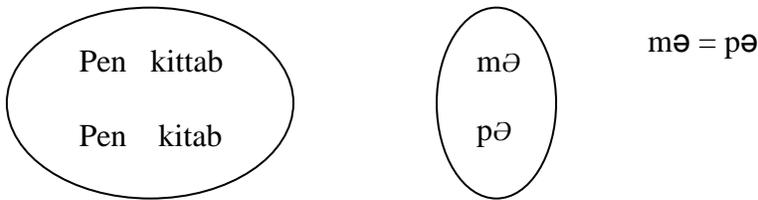

$mə = pə$

Diagram – I -　Post position without *che.*
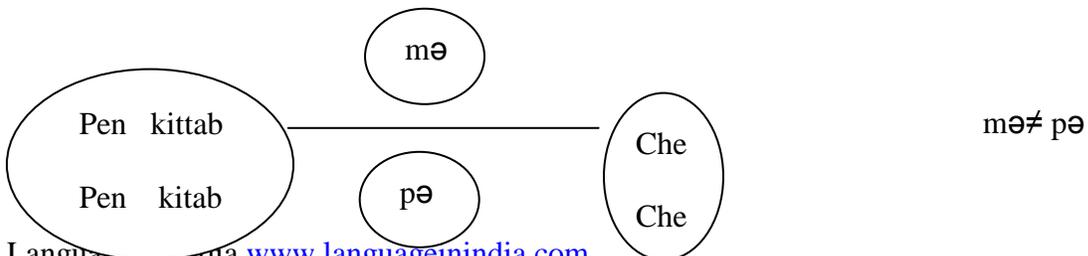When *che* comes

$mə \neq pə$

Diagram – II – Post position with *che.*

We can say that both mə and pə locatives function like planets, and do not possess any light of their own but when the verbal element *che* comes like sun they start illuminating and showing their light.

Principle of Economy

Then the logical question arises why do we not use full expression in our day to day conversation? The possible answer is: we have been attuned to the economy principle since our childhood. Children expect from their adults to understand what they are intending to say with context by using minimal expressions. For example, if a child says "mil" she may try to express:

   a. Milk, no milk
   b. Give me milk.
   c. I like milk
   d. I hate milk
   e. I have taken milk; and thousands of expressions

Now it is up to the mother to understand the minimal expression in right context. Similarly competent speakers want to use language minimally, and try to express maximal meaning. The inborn economy tendency in every human being gives rise to the infinite expressions.

Another possibility is that locative expressions show their dependency on other lexicon (noun, verb, etc.), when they come as post position and adverb. As for example:

7. *kəməra   süü   fəl   le   ao.*
   Room   from   fruit   take   come.
   Bring the fruit from the room.

And

8. *kəməra   mə   fəl   le   ao.*
   Room   in   fruit   take   come.
   Bring the fruit in the room.

Here *suii* and *mə* represent certain spatial location and their meaning is inversed to one another with reference to the movement of object and goal.
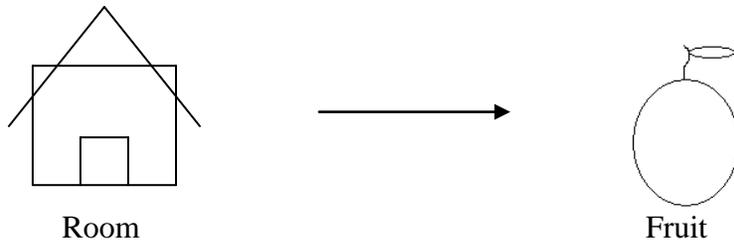
Room

Fruit

Diagram – III – Movement of object from location for suü

Room

Fruit

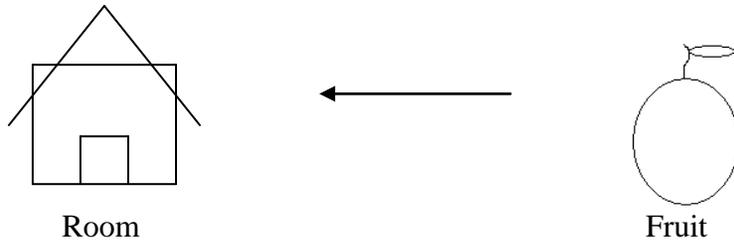**Diagram – IV –** Movement of object to location for mə

But interestingly there is a post position məsə i.e. made of suü and mə but gives the meaning of locative of suü. The reason for this variation is explained as null hypothesis in the paper further. The evidence of null post position is also found in certain noun phrases. As in the question:

9. *Ram   kəthe   che*?
   Ram   where   is?
   Where is Ram?

The possible answer would be *ghar pə or ghar mə, kəməro pə or kəməro mə* "in home or at home, in the room". Here *ghar* "home" and *kamaro* "room" take both the post-positions *mə* and *pə* but there are certain lexicons like *iskul, bajar, cok,* etc. that come with only *mə* post- position, and don't allow the occurrence of *pə*. But both of the above mentioned post-positions indicate aim, goal, and objective in the similar manner. The possible criteria for this post-positional selection for specific lexicons can be understood and explained by the following diagram:
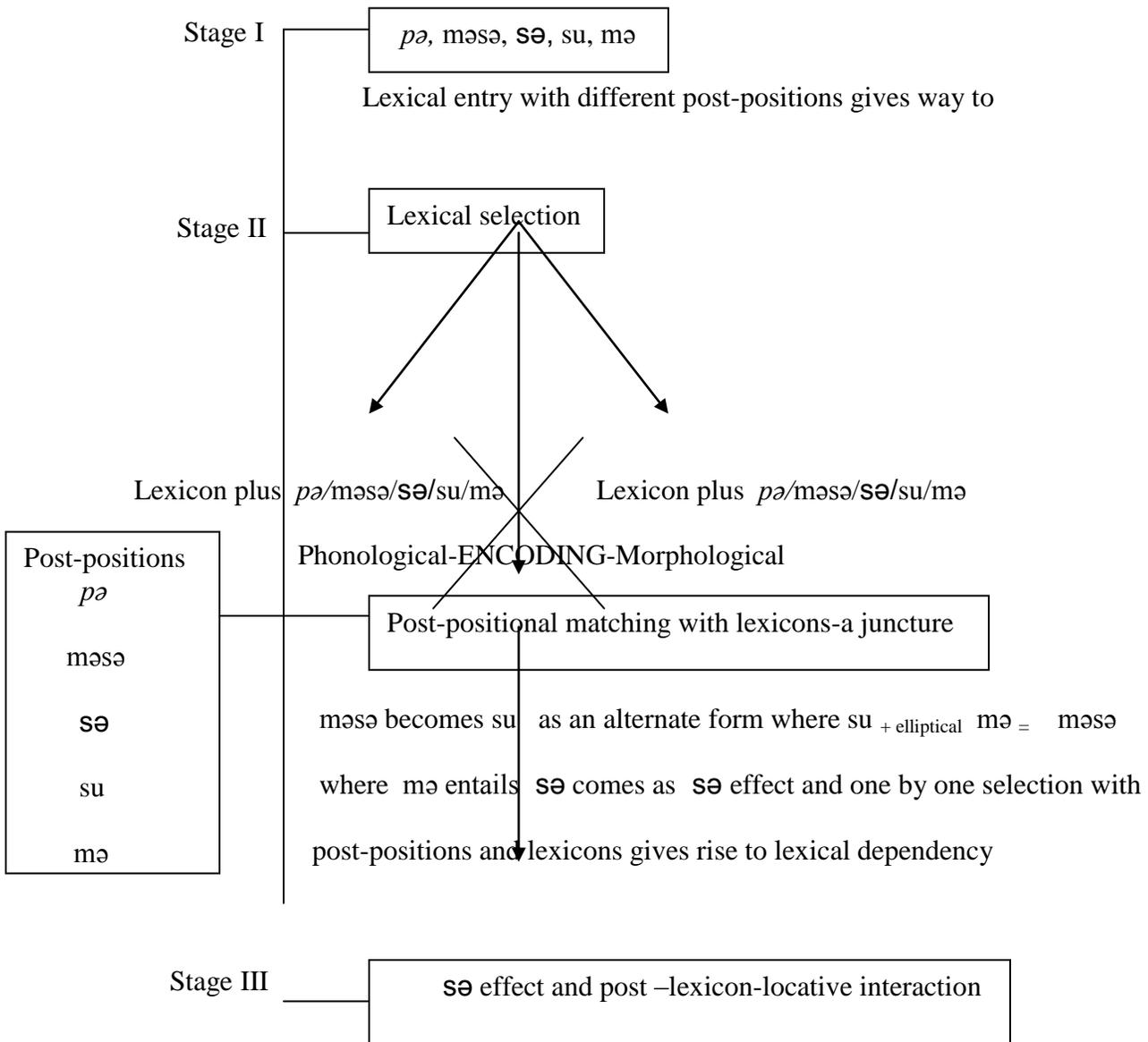
Stage I ———— | _pə,_ məsə, **sə**, su, mə |

Lexical entry with different post-positions gives way to

Stage II ———— | Lexical selection |

Lexicon plus _pə/_məsə/**sə**/su/mə   Lexicon plus _pə/_məsə/**sə**/su/mə

Phonological-ENCODING-Morphological

| Post-positions
 _pə_

 məsə

 sə

 su

 mə |

| Post-positional matching with lexicons-a juncture |

məsə becomes su as an alternate form where su $_{+ \text{elliptical}}$ mə $_=$ məsə

where mə entails **sə** comes as **sə** effect and one by one selection with

post-positions and lexicons gives rise to lexical dependency

Stage III ————— | **sə** effect and post –lexicon-locative interaction |

Diagram – IV–Computational model reflecting sǝ effect and post lexicon locative interaction

This computational model tells us the reasons why certain lexicon items come with the specific postpositions. As far as the post lexicon locative is concerned, the choice of the locative with the lexicon behaves like a person who is on the road without zebra crossing, and wants to cross the road. The selection of that person for the right timing depends upon an inbuilt calculations of nature that are far more complex and refined than that of advanced mathematics and physics. The competent language user of Haroti uses contextually correct and pragmatically congruous locatives because of null hypotheses and filtering hypotheses.

Till now we have seen most of the examples with nouns. Before putting forward the hypothesis let us have a look at some sentences showing how do the verbal elements affect the selection of post positions. For example:

9.a Raam ghar jaavo che

   [Ram home go is]

   'Ram goes to home'

b. Raam ghar (na) jaavo che. (na = to)

c. Raam gahr (ne) jaavo che.(ne= to)

d. Raam ghar (aadi) jaavo che.(aadi= towards)

e Raam ghar (suu) jaavo che.(suu= from)

   '

Those given in parentheses (na), (ne), (aadi), (suu), are different postpositional choices which the speaker may or may not use in the conversation. To tell when a native speaker uses them is a matter of the electrical discharges in brain and nervous system. But we can give a general theoretical description for the above sentences.

We show:

There is a transfer of agent 'a' from any fixed or moving point 'p' and the goal is

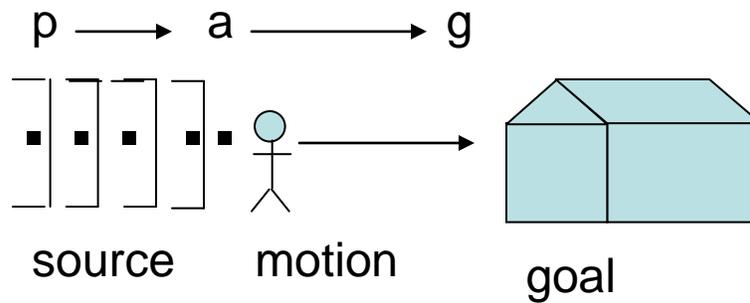'g'. then, the whole process would be shown in the diagram.

Diagram-V- Movement of agent from the source to the location.

As we know that in any communication, speakers construct sentences which depict states (s) of affairs which the communicators wish to convey to their interlocator(s). In Haroti, we have these prepositions (na), (ne), (aadi), (suu) in the sentences 9.b, c, d, and e, which give the similar sense (s) of 9 a. But the ambiguity among postpositions which the brain fails to compute can be defined through probability mechanics.

All these postpositional (nil prep), (na), (ne), (addi), (su) = to) expressions in Haroti have high randomness in the conversation. We will give two hypotheses to show how this ambiguity can be solved in computers by monitoring some of its operations.

A.   Null postposition hypotheses

Our first hypothesis states there is a nil preposition in Haardutii which conserves all the other prepositions given in the parenthesis. In the sentence Raam ghar jaavo che (IIa), the elliptical gap between ghar and jaavo is filled by (na), (ne), (aadi) or (suu). We show this:
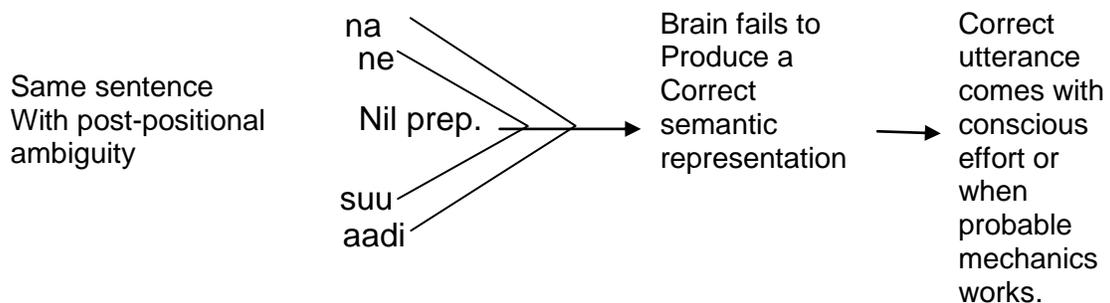

Diagram-Vl-. The relationship between postpositional ambiguities, brains fallacy and probability mechanics

The speakers use the sentence 9a or they may use 9 b, c, d, and e. respectively. We suppose they use either 9 d or 9 e at random with equal probability, i.e. with probability

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of 1/2. But for 9 b and 9 c, there is also an internal probability of 2/3 for the null postpositional sentence; because the difference between (na) and (ne) is very minute for the speakers (some speakers prefer na instead of ne). we can then find the randomness for computation:

9s   a   = $1/2 \times 2/3 = 2/6 = 1/3$

This probability result has come out when we consider na = ne, and aadi=suu in 9b, 9c, 9d and 9e. (as a native speaker of Haroti my tacit knowledge permits me to equal then and later apply them in a context free sentence). But still we have seemingly three sentences, one is with null postposition, and the rest of the two are with either na/ne or aadi/suu. In order to move from this postpositional ambiguity, we need a filtering device which can filter out the wrong expression.

B. **Filtering hypotheses**
Our awareness in the conversation shows that computation process is something we do sometimes, not all the time. The brain's fallacy and the probability mechanics show this above. In natural language processing, we require to have access to the syntactic analysis of the sentence as well as knowledge of the prior discourse to produce a correct semantic representation. This filtering device exists in human body as a prior discourse but in computers to get the desired outcome from the filled data in language is still a big problem. Our main work is to disambiguate the sentences.

Let us rewrite the sentence 9 with modification

10   a. Raam ghar jaavo che [par ni phuche]
                                but neg. reach (trans)
      b. Raam ghar (na) jaavo che [par ni phuche]
      c. Raam ghar (ne) jaavo che [par ni phuche]
      d. Raam ghar (aadi) jaavo che [par in phuche]
      e. Raam ghar (suu) jaavo che [par in phuche]

The additional phrases given in the brackets play a crucial role to disambiguate the postpositional differences. Earlier we have placed the null postposition as the store house of the other postposition i.e. (na), (ne), (aadi) and (suu). But interestingly when we add the additional information to the previous sentences in 10b and 10c prove to be incorrect.

This indicates an important factor which, in turn, decodifies the postpositions. The phrase par ni phuchei 'but doesn't reach' represents an unfulfilled goal which gives an oppositional sense relation to (na) and (ne).

The filtering device which is a negative expression of the verb deletes sentences 10b and 10c from the computational system. We show this in the following diagram:

FILTER

| Raam ghar | Nullloctives (na) (ne) (aadi) (suu) | → → → → → → | ni phuche | Jaave | Nullloctives * 10b *10c → aadi 10d → suu 10e | Che |

Diagram-Vll- The filtering device shows the unacceptable sentences

Earlier we have seen in 9 that all the expressions were giving the same sense; and the usability criterion was on the random selection for computation.

In VII we have shown that, with the help of filtering device, we have not only cleared the half ambiguity but also the excessive probability. And there are other verbs in Haroti which also behaves in the same manner. As we show:

Raam	Noun	[nil prep; na, ssu, aadi etc.]	Verb che	F I L T E R I N G	N E G A T I V E
Raam	Noun-haath,	'hand'	Verb- jale 'to burn' che		
Raam	Noun – Kursi	'east'	Verb- bethe 'to sit' che		

Diagram –VIII- Generalized filter for the simple sentences

Hence, we can say there is a neuro-functional mechanism at work in brain which often permits ambiguity in expressions, and interlocutors often decode the ambiguity by pragmatic fillers. But, at the same time, the meta-linguistic system which monitors the correctness of the sentences (about to be produced), can be modified semantically to delete ambiguous representation. This device can solve half the ambiguity of computation for certain Haroti postpositions.

To sum up

I have studied here the relation between problem-solving and comprehension. I have gathered some evidence showing that locative problems have a vague structure, which needs to be revealed if these problems are to be solved in a principled manner. I have also indicated that the comprehension of the locatives problem is not a frame-based process, but rather is a constructive process by means of which the deep structure is built from the
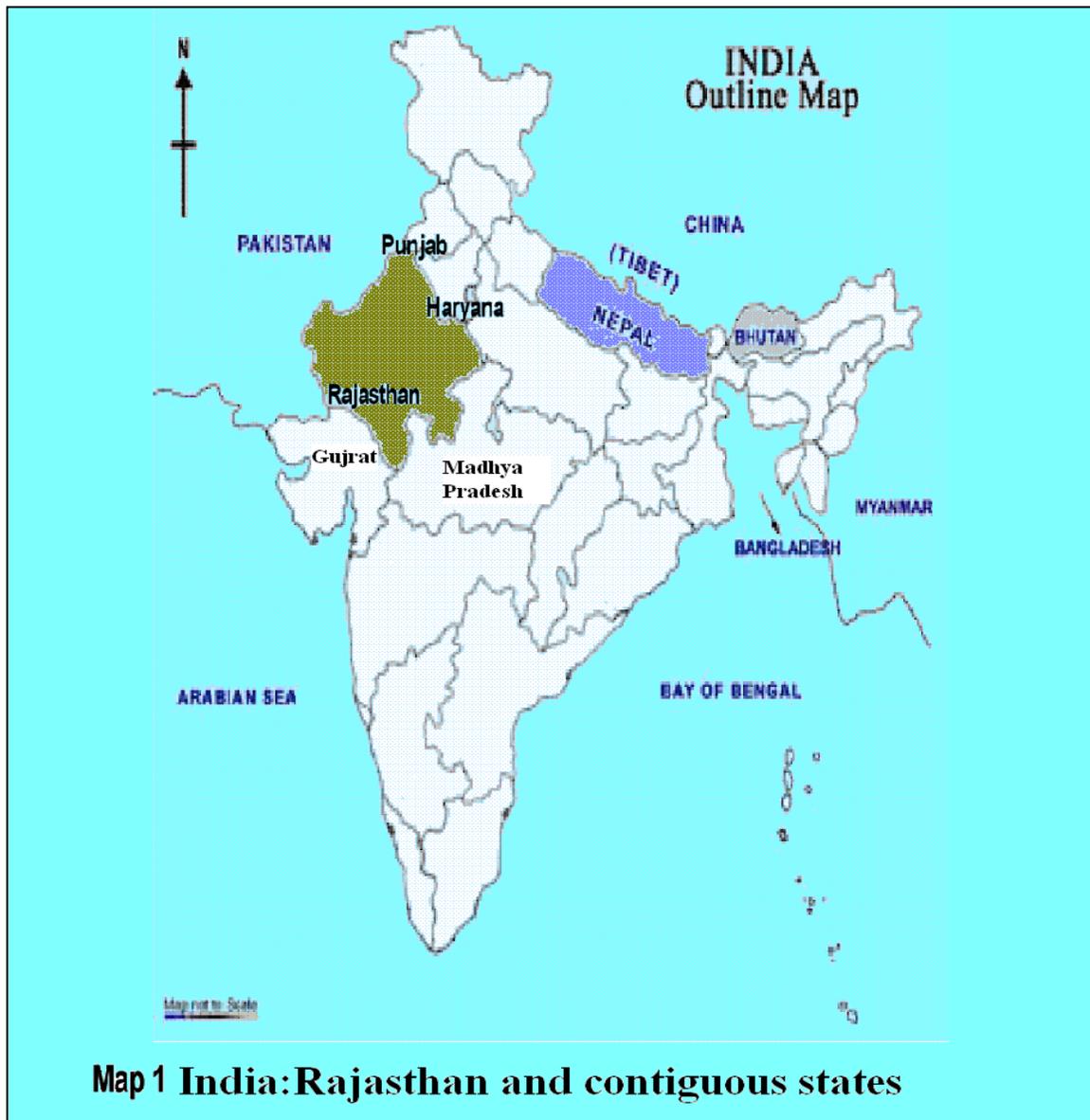
sentences describing the problem, in a way similar to the construction of an atom from the molecules.. This constructive process is done by means of computational model and generalized filter, which builds the deep structure on the basis of the semantics of the logical forms of the sentences and on the deep structure under construction. These ideas are being applied to the construction of databases from natural language input.
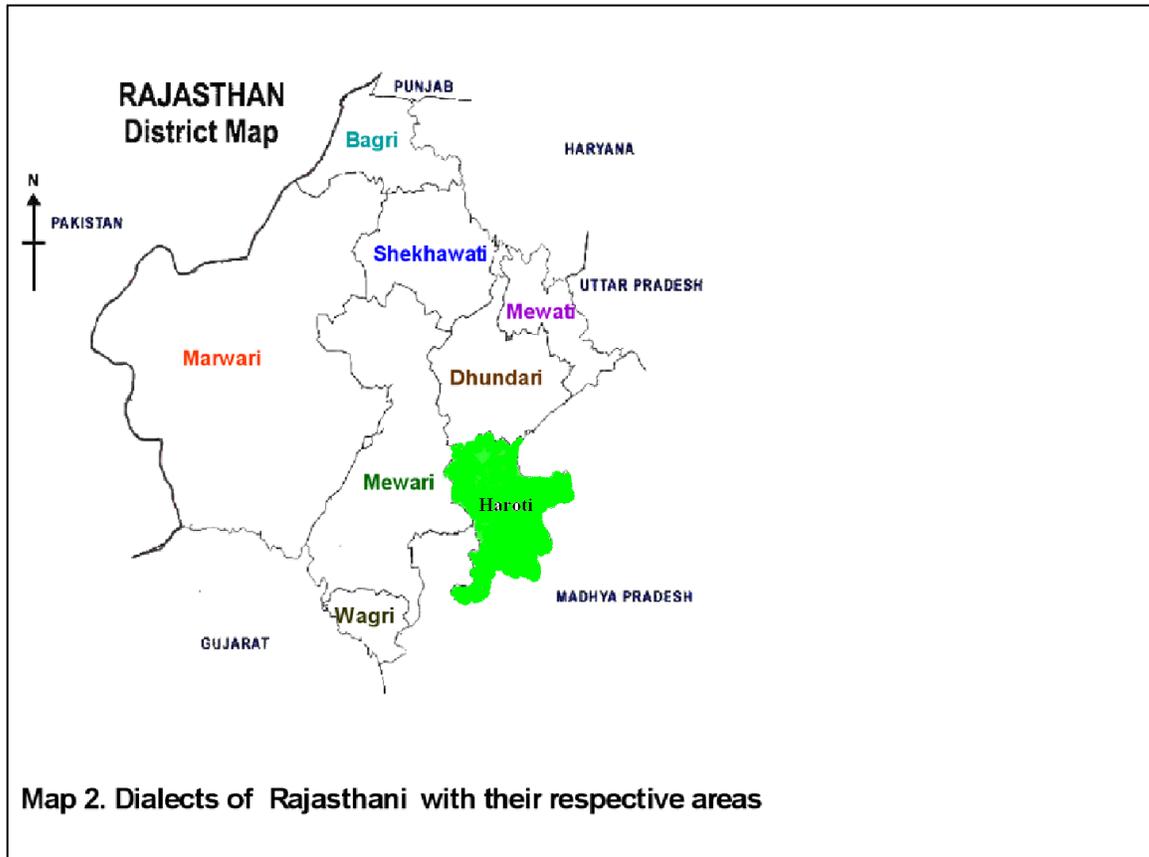
Appendix – I

Map 1 India: Rajasthan and contiguous states

Appendix - II

RAJASTHAN
District Map

Map 3. Haroti Speaking Area

Appendix - III

RAJASTHAN
District Map

PUNJAB

Bagri

HARYANA

N

PAKISTAN

Shekhawati

UTTAR PRADESH

Mewati

Marwari

Dhundari

Mewari

Haroti

MADHYA PRADESH

Wagri

GUJARAT

Map 2. Dialects of Rajasthani with their respective areas

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Appendix - IV

Place of articulation		Labial	Dental	Retroflex	Palatal	Velar	Glottal
	*v .unasp.	p	t	ṭ	c	k	
	*vl.asp.	ph	th	ṭh	ch	kh	
	*vd. unasp.	b	d	ḍ	j	g	
	*vd.asp.	bh	dh	ḍh	jh	gh	
	*nasals	m	n	ṇ			
	vl.fricative		s				h
	lateral		l	ḷ			
	thrill		r				
	flap			ṛ			
	frictionless				y		
Abbreviations	* Stops: Vl - Voiceless; unasp - unaspirated; Vd - Voiced; asp - aspirated						

Appendix - V

	Front	Central	Back
High	i		u
Lower high	ī		ū
Mid	e	ə	o
Low	ɛ́	a	

<u>Haroti Vowels</u>

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