

# **Arity operations in Hindi: A Lexicon-Syntax Interface Perspective**

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**ABSTRACT:** This paper is an attempt to probe into arity operations in Hindi from the perspective of Lexicon-Syntax interface. It provides evidence that though passivization in Hindi is not similar to its counterpart in English (where saturation of the external  $\theta$ -role happens, i.e. canonical passive), it is a valid arity operation. It also tries to place the arity operations either in the syntax or in the lexicon.

**Key Words:** Arity Operations, Lexicon, Syntax, Lexicon-Syntax Interface.

## **Section 1**

### **Arity Operations**

The notion ‘arity operation’ was used initially to define lexico-semantic changes. An arity operation/valence changing operation, according to Chierchia (1995), changes certain characteristics of the predicate and determines the interpretation of certain arguments. For example, in Italian, the clitic ‘*si*’ is such an operation that takes a property (predicate) and does two things to it – (a) Existential closure of the subject argument and (b) Restriction of the range of such an argument to groups of humans.

Reinhart (2000, 2002) argues that the arity operations alter the thematic properties of a given verb and we have different readings of that verb as a

result of lexical or syntactic mechanisms. She distinguishes two types of arity operations: (a) Reduction (either eliminating a  $\theta$ -role of the verbal grid altogether or only disabling the syntactic realization of the argument) & Saturation – these arity operations reduce the number of theta-roles of the verb, e.g. unaccusatives, passives and (b) second that augment the number of theta-roles, creating a new theta-role, e.g. causatives.

## **Section 2**

### **Arity Operations in Hindi**

Hindi, a modern Indo-Aryan language, is supposed to have two kinds of arity operations – passivization & causativization. Though, Hindi passive, on surface, also seems to have an existential closure of the subject argument, Mahajan (1994), Richa (2011), Srishti, Richa & Shahid Bhat (2012) and Chandra & Sahoo (2012) have shown that the passives in Hindi and also in other South-Asian languages are not similar to the canonical passives.

The passive subject, in these languages, retains the properties of the subject and the object is never promoted to the the subject position, i.e. it also retains its object properties. This is attested by the tests like anaphor binding, pronominal co-reference, control etc.

The agentive phrase, like the matrix subject, can bind the possessive reflexives, shows anti-subject orientation, can control into the argument clauses and adverbial clauses as well in subject controlled constructions. The passive object, on the other hand, can retain the accusative marker like the object and can have a pronominal coreference like the active object.

Possessive reflexives in Hindi must be bound by the matrix subject. Similarly, the agentive phrase in Hindi passives binds the possessive reflexive:

1) səlmɑ<sub>i</sub> d̪wara əpne<sub>i</sub> g<sup>h</sup>ər ka nɪrɪkʃən kɪja gəja

Salma by self's home GEN examination do-PFV go-PFV

'Self's house was examined by Salma.'

The agentive phrase in passives also shows anti-subject orientation like pronouns:

2) səlmɑ<sub>i</sub> d̪wara uske<sub>i</sub> g<sup>h</sup>ər ka nɪrɪkʃən kɪja gəja

Salma by her home GEN examination do-PFV go-PFV

'Her<sub>\*i</sub> house was examined by Salma<sub>i</sub>.'

Like subjects, the agentive phrase in passives can also control into argument clauses in the subject control construction:

3) səlmɑ<sub>i</sub> d̪wara [PRO<sub>i</sub> g<sup>h</sup>ər ja na ] cha gəja

Salma by home go-INF want-PFV go-PFV

'It was wanted by Salma to go home.'

They can also control into conjunctive participle adverbial clauses like subjects in Hindi:

4) səlmɑ<sub>i</sub> d̪wara [PRO<sub>i</sub> g<sup>h</sup>ər ja kər] mohən ko d̪āʈa gəja

Salma by home go do Mohan ACC scold-PFV go-PFV

'Mohan was scolded by Salma after she went home.' (Mahajan 1994)

Furthermore, Mahajan (1994) provides evidences to show that the object in the ACTIVE Passive behaves just like as it does in active constructions:

5. i) *raja d̥wara sare ʃerõ ko mar d̥ija gəja*

king by all tigers ACC kill give-PFV go-PFV

'All the tigers were killed by the king.'

ii) *si:ta<sub>j</sub> d̥wara səlma<sub>i</sub> ko uske<sub>i/\*j</sub> g<sup>h</sup>ər b<sup>h</sup>eʃ d̥ija gəja*

Sita by Salma ACC her home send give-PFV go-PFV

'Salma was sent to her home by Sita.'

iii) *ram d̥wara mohən<sub>i</sub> ko [PRO<sub>i</sub> g<sup>h</sup>ər jane ke lije] kəha gəja*

Ram by Mohan ACC home go-INF GEN for tell-PFV go-PFV

'Mohan was told by Ram to go home.' (Mahajan 1994)

In (5i), the object can retain the *-ko* marker in the passive. (5ii) shows that the pronoun in passive can corefer with the object as the latter has not moved to the subject position and (5iii) indicates that the object has not been promoted as it can still control into the complement.

Hence, passivization in Hindi can neither be termed as reduction (there is no elimination of a  $\theta$ -role of the verbal grid and no disabling of the syntactic realization of the argument) nor saturation and if we define it in strict terms (i.e. arity operations as altering the thematic properties of a given verb), it does not seem to be a conventional arity operation.

But according to Chierchia (1995)'s definition of an arity operation, it does change the characteristics of the predicate and also determines the

interpretation of the argument as it 'defocuses' the active subject by encoding the agent as an oblique argument. Thus, it can be established as a valid arity operation.

On the other hand, Causativization, in Hindi, creates a new theta-role, causee/the intermediate causer that appears as an oblique NP and is optional too. Though, its optionality has cast doubt on its status as an argument (Ramchand 2008, 2011), Richa (2011) & Srishti, Richa (2012) has argued that it is an argument in Hindi and in other SALs as its control and binding properties show. She also argues that though the causee is marked instrumental/ablative, it is clearly different than other instruments/ablative adjuncts.

- (6) somi (ru:na-se) vanka-ko hãswaṭa he  
 Somi Runa-INS Vanka-ACC laugh-CAUS-HAB be-PRS  
 'Somi makes Runa make Vanka laugh.'

Like subject arguments, the causee can easily control into the participial clauses:

- (7) ram<sub>i</sub>-ne mina<sub>j</sub>-se mohana<sub>k</sub>-ko [PRO<sub>i/j/k</sub> k<sup>h</sup>aṭe hue ] piṭwaja  
 Ram-ERG Mina-INS Mohan-ACC eat-PRS.PTCP be-PFV hit-CAUS-PFV  
 'Ram<sub>i</sub> made Mina<sub>j</sub> hit Mohan<sub>k</sub> while PRO<sub>i/j/k</sub> eating.'

- (8) maṣṭar ne bæcce se pəṭəŋg [PRO<sub>i/j</sub> muskuraṭe hue ] uṭwai  
 teacher-ERG child-INS kite smile-PRS.PTCP be-PFV fly-CAUS-PFV  
 'The teacher<sub>i</sub> made the child<sub>j</sub> fly the kite while PRO<sub>i/j</sub> smiling.'

- (9) ram-ne kəṃre mē g<sup>h</sup>uṣṭe hue somi-se hãṣṭe hãṣṭe māheṭ-ko piṭwaja

Ram-ERG room in enter-PTCP be-PFV Somi-INS smile-PTCP smile-PTCP Mahesh-  
ACC hit-CAUS- PFV

‘Ram<sub>i</sub> made Somi<sub>j</sub> hit Mahesh<sub>k</sub> while PRO<sub>i/j/\*k</sub> entering the room while  
PRO<sub>i/j/\*k</sub> smiling.’

Furthermore, if we passivize (8), the sentence turns out to be ambiguous – on one interpretation it is the implicit agent which is the controller and on the other, it is the implicit causee:

(10) pəṭəŋg [PRO<sub>i/j</sub> muskurəṭe hue ] uṭwai gəji  
kite smile-PRS.PTCP be-PFV fly-CAUS-PFV PASS-PFV.F  
‘The kite was made to fly while PRO<sub>i/j</sub> smiling.’

Furthermore, it has been observed that only subjects/external arguments may (Kidwai 1995, 2000, Richa 2003) bind the possessive reflexives, arguments originating in the VP do not .

(11) ram<sub>i</sub>-ne moni<sub>j</sub>-ko əpni<sub>i/j</sub> kiṭab ləṭai  
Ram-ERG Moni-ACC self’s book return-TR.PFV.F  
‘Ram returned Moni his/\*her book.’

The causee in Hindi, too, can bind the possessive reflexive:

(12) mina<sub>i</sub>-ne miku<sub>j</sub>-se əpna<sub>i/j</sub> dərwaṣa k<sup>h</sup>ulwaṣa  
Mina-ERG Miku-INS self’s door open-CAUS-PFV  
‘Mina made Miku open her / his door.’

Hence, it appears that the causee argument must also be “high” in position. But, the interesting point is that the anti-subject orientation does not hold with the causee argument, suggesting that it is not really in the “subject”

position. In other words, though it is a 'high' argument, it is not 'so high' to be counted as the 'subject.'

(13) *sara<sub>i</sub>-ne moni<sub>j</sub>-se mili<sub>k</sub>-ko uske<sub>\*i/j/k</sub> g<sup>h</sup>ər mē mərwaɟa*

Sara-ERG Moni-INS Mili-ACC her house in kill-CAUS-PFV

‘Sara<sub>i</sub> made Moni<sub>j</sub> kill Mili<sub>k</sub> in her<sub>\*i/j/k</sub> house.’

### Section 3

#### Lexicon-Syntax Interface

In current minimalist framework, the lexicon is merely a list of idiosyncratic 'building blocks' and syntax uses this list to build linguistic expressions. In other words, the argument structure and all kinds of verbal alternations are derived in the syntax. Lexicon acts as an inventory and producer of words (Chomsky 1970). But many scholars (Selkirk 1982, Di Sciullo & Williams 1988, Levin & Rappaport Hovav 1995, Reinhart & Siloni 2005 among others) consider that the lexicon is not a mere repository, it plays a major role in structure building.

It is agreed upon that there does exist a corelation between meaning and structure, it is the nature of this corelation that differs. Some (Chomsky 1986, Baker 1988, Tenny 1992, 1994, Pesetsky 1995, Levin & Rappaport Hovav 1995, Larson 1988, Grimshaw 1990) consider that the syntax of verbs is projected from their lexical entries, and also determined by them, while others (Hoekstra & Mulder 1990, Borer 1994, van Hout 1996) assume that at least part of the interpretation of individual arguments depends on the syntax of the entire predicate, rather than on specification of lexical entries.

Siloni (2002) advocates an 'active lexicon' approach and claims that “UG must allow derivational operations to apply before syntactic structure is available.” Reinhart & Siloni (2003) propose 'Lex-Syn Parameter' and argue that there

are some arity operations that can apply in the lexicon and some in the syntax:

“UG allows arity operations to apply in the lexicon or in syntax”

She argues that for the design of language to be optimal, the lexicon and the syntax must be nonredundant, having different nature and different constraints. The lexicon as an inventory of concepts must not contain syntactic structure. Distinct predicates have no relation between them in the lexicon, it is in the syntax that they are put together. Hence, the arity operations in the lexicon can only apply to a concept (a predicate) along with its  $\theta$ -roles and can never involve  $\theta$ -roles of distinct predicates. Syntax, on the other hand, cannot change the  $\theta$ -grid of a predicate (Lexicon Interface Guideline).

Reinhart & Siloni (2005) argue that lexical arity operations apply to the verb entry itself, which is a collection of properties/features, and not to an abstract event semantics representation. Moreover, given the Lex-Syn Parameter, they clearly state that the arity operations occurring in syntax are more productive than those in lexicon (as it can only target a set of verbs).

Based on the crosslinguistic variation in the behavior of reflexive verbs, Reinhart & Siloni (2003, 2005) show that in certain languages (e.g. English, Dutch, Russian etc.) reflexives are formed in the lexicon and in others (e.g. German, Greek, Serbo-Croatian) in syntax (in accordance with the Lex-Syn Parameter). Contrary to Grimshaw (1982), Chierchia (1989/2004), Kayne (1988), Pesetsky (1995), and Sportiche (1998), where the first two advocate reflexivization as a lexical operation and the rest prefer its syntactic version, Reinhart & Siloni (2003) argue against the two approaches and provide evidence that same operation can either happen in lexicon or in syntax.



## **Section 4**

### **Final Remarks**

As shown in the earlier section, passivization in Hindi is neither a reduction nor a saturation operation, though it is an arity operation. Causativization, on the other hand, is an operation that augments a new theta-role. Thus, passivization in Hindi can be said to be applied in syntax as it does not introduce any new  $\theta$ -role but causativization can only be applied in lexicon as it changes the  $\theta$ -grid of the predicate.

Though, if we consider the productivity argument given by Reinhart & Siloni (2003, 2005), its opposite happens in Hindi; causativization that operates in lexicon is less productive than passivization. To elaborate, passivization in Hindi operates on a larger set of verbs compared to causativization; causativization can operate on any only transitive verb whereas unergatives as well as transitives can undergo passivization.

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