

Projection of lexical information: A study in case and semantic roles

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1. Introduction

This paper is an exploratory study of the Hindi/Urdu lexicon, focusing on how the arguments of a predicate are projected into the sentence built around the predicate. We assume that universally predicates have certain number of arguments, of which some are obligatory, and each argument has a distinct theta roles and grammatical function (subject, direct object, indirect object, obliques, etc) The grammatical function of an argument is indicated in the overt form of the clause with a combination of case and configurational relations; subjects are particularly distinguished by being the 'external' argument, outside of VP and c-commanding the other arguments. A fundamental question has been to define the regular links between case and grammatical function, and between case and thematic role. Subjects are generally nominative in languages which make overt case distinctions, and nominative subjects of transitive verbs especially have the *Agent* theta role. Dowty (19--) defines the thematic traits which are associated with typical subjects and direct objects. Agency (instrumentality and volition) is characteristic of Proto-subjects, while the opposite (absence of volition, affectedness) is typical of direct objects. But in every language specific predicates are exceptions to the default pattern, and there are thematic relations associated with predicates which are not easily distinguished using the canonical or default *Agent/Patient/Theme* characteristics. This is particularly true for experiencer predicates, and for certain types of verbs with optional arguments.

Languages with ergative case systems are particularly difficult to characterize in standard thematic linking relations to case and grammatical function. This is certainly true of Hindi/Urdu, a language with ergative subjects and nominative objects, as well as postpositional case uses which are selected by specific lexical items. The lexicon of this

language

The problem. For languages with ergative structural case on subjects, it should not be necessary

for the language learner to learn each verb as an ergative assigner. Some common property of these verbs should allow the speaker to predict whether ergative case is possible or not for a given verb. This paper uses the lexicon of a split-ergative language, Hindi/Urdu to define the structural bases on which prediction can be made for a given verb. In this language, many verbs require ergative case (in finite, perfective clauses) (1), some allow ergative as an option (2), and others prohibit it entirely, requiring dative on experiencer goal subjects (3) or only nominative (5).

(1) a. Obligatory ergative subjects

deekh-naa ‘see’
paRh-naa ‘read’
sooc-naa ‘think’
jaan-naa ‘know’
dhookaa khaa-naa ‘be deceived’

(1)b. Optional ergative subjects

pahcaan-naa ‘recognize’
bhuul-naa ‘forget’
haar-naa ‘lose (match/war)’
samajh-naa ‘understand, realize’
bhaaNp-naa ‘intuit, figure out’

(3) a. Experiencer/goal subject verbs

:Nominative object, *koo (dative)

sunaaii dee-naa ‘hear’
dikh-naa ‘be visible to’
bhaa-naa ‘like, suit’
mil-naa ‘get, obtain’

-see uub hoo-naa ‘be bored with’
-par pachtaavaa hoo-naa ‘regret’
-see ciRh hoo-naa ‘feel aversion to’
-see khiijh hoo-naa ‘be annoyed at’
-see Dar hoo-naa ‘fear’

(4) Lexical cases: -see ‘from’, -par ‘on’ -meeN ‘in’

(5) Nominative subject only
transitive/nominal

(a) -see Dar-naa ‘fear’
-see rijh-naa ‘feel attracted to’
-see uub-naa ‘be bored by’
-par pachtaa-naa ‘regret, repent about’
-see gabRaa-naa ‘be perplexed by’
(b) -par/meen pahuNc-naa ‘arrive’
-see nikal-naa ‘come out of’
-see utar-naa ‘come down from’
-see mil-naa ‘meet’
-par jhapaT-naa ‘pounce on’
-see/par laR-naa ‘fight with/over’

(6) Corresponding Ergative

Daraa-naa ‘frighten’
rijhaa-naa ‘attract, lure’
ubaa-naa ‘bore’
N. pachtaavaa ‘regret’
Adj./N gaRbaR ‘confusing, confusion’
pahuNcaa-naa ‘cause to arrive at’
-see nikaal-naa ‘take out from’
-see utaar-naa ‘bring down from’
milaa-naa ‘mix, bring together with’
jhapaTTaa ‘swoop, dash’
laRaa-naa ‘to cause to fight’
N. laRaaii ‘fighting’

In specific contexts, there appear to be differences of theta roles, for example an

agentive argument rather than an experiencer. The relations of the arguments to the predicate would seem to be constitutive of the meaning of the predicate. If the differences of case arrays actually indicate differences of theta roles, then difficulties arise in capturing what is semantically constant about the uses of the 'same' stem, and what meaning is shared by 'related' stems. The goal of this study is to ask what differences among related senses or related predicates are most consistently associated with case alternation: is it differences of theta roles, or differences of inherent verbal aspect? I will propose that the principal factor is verbal aspect, a covert category in many languages (Smith 1997).

2. Lexical properties of predicates

2.1 Case and thematic roles

Case in Hindi-Urdu is principally expressed by postpositions. Some postpositional case is assigned structurally to specific syntactic configurations. I assume that the genitive *-kaa* is a structural case in most of its uses: it is assigned to possessors in DP and subjects in non-finite clauses. Likewise the null or nominative case is assigned by INFL to subjects and by V to direct objects. I treat the ergative *-nee* as a structural case assigned to subjects of most transitive verbs, and *-koo* as a structural case assigned (under some pragmatic conditions) to direct objects, though this idea is controversial.

The structural cases are sensitive to grammatical function not to specific theta roles. Inherent cases are associated with specific theta roles and selected by specific predicates. For example, the dative *-koo* is associated with goals and experiencers when it is selected by the predicate for an indirect object. The variety of locative expressions *-meeN* 'in', *par* 'on', *-see* 'from, with' and the benefactive *-kee liyee* 'for the sake of' are also inherent cases selected by the predicate for themes and destinations. The types of structural and inherent cases associated with monomorphemic and complex verbs are discussed in Davison 1997).

2.2 Aspectual categories of verbs

Verbs refer to states of affairs whose intrinsic properties vary (see Smith 1997 and reference therein, Verkuyl 1993). Some events take place over time, with some variation in what goes on moment by moment, and so are [+durative]. Some events come to a natural end point or culmination, and so are [+telic]. States have the property of being completely uniform and non-dynamic [+static]. I cite below a classification of aspectual types from Smith 1997:20, and a summary of verb classes based on the same work.:

(1) <i>Situation</i>	<i>Static</i>	<i>Durative</i>	<i>Telic</i>
States	+	-	-
Activity	-	+	-

Accomplishment	-	+	+
Semelfactive	-	-	-
Achievement	-	-	+

States include verbs like *know, think (that), like, dislike be irritated at*, etc, and some senses of *undertand, consider*. They are typically non-agentive and have no natural end point. Achievement verbs are also not agentive, as reaching the end point is not fully under the control of (the referent of) the external argument. Such verbs include *recognize, realize, understand, consider, find, win, lose, reach* etc. Semelfactives, a category which will not be discussed in this paper, include verbs like *knock, cough, sneeze, flicker, tap, kick*, referring to events which happen very quickly and have no lasting result. Activities, a very large and productive class, refer to events with duration, perhaps under agentive control, but with no inherent or natural end-point. They include aspectual verbs like *continue, keep on*, and others like *eat, drink, cook, walk, run*, and degree predicates like *widen, cool*. Accomplishments verbs relate the process and the outcome, as in *write a letter, build a house, draw a circle*; at each sub-interval or internal the letter is being written, the circle is being drawn. In contrast, in *recognizing a face*, the actual recognition takes place at the culminating instant, not in the preceding stages.

Verbs may shift from one category to another, depending on the object (*build houses* is an activity) or adverbs (*sneeze for 5 minutes*). I will focus as much as possible on senses of verbs which are not influenced by such factors. See Verkuyl 1995 and Smith 1997 for more discussion.

The predicting factor cannot be agent theta role, since some ergative subject verbs have the role of experiencer (pahcaan-naa ‘realize’), patient (dhookaa khaa-naa ‘be deceived’),

and many non-ergative subject verbs have the agent role (laR-naa ‘fight with’, jhapaT-naa ‘pounce on’). Similarly, it cannot be inherent verbal aspect, since each class contains more than one aspectual type. For example ergative subject verbs include activities (sooc-naa ‘think’), states (jaan-naa ‘know’), achievements (pahcaan-naa ‘recognize’, deekh-naa ‘see’) and accomplishments (causatives like baRhaa-naa ‘increase’, milaa-naa ‘mix, bring together’). Transitivity is a closer match, since all ergative subject verbs (with 4-6 lexical exceptions) are transitive (1)-(2). But not all the verbs which take more than one theta-marked argument have ergative subjects (3) and (5).

5. The related meanings of *mil*

The verb mil ‘meet, mingle, mix, meet by chance, get’ has a variety of meanings and associated differences of case marking.

(2) Dative subject (goal), nominative object (theme):

a. *mujhee Daak-see doo patra mil-ee*

matrix subject. The dative goal counts as a controller of the conjunctive participle subject (6b)::

- (6) a. *joon_i -koo apnaa_{i/*j} ghar mil ga-yaa*
 John-DAT self's house get go-PF

John_i got his_{i/*j} house (Gurtu 1992:25)

- b. [*PRO_{i/*j} videeSiyooN-kii naqal kar*] *-kee tum_i -koo kyaa mil-eegaa?*
 foreigners-GEN imitation-do-PRT you-DAT what get-FUT

‘What will you get out of imitating foreigners?/PRO having imitated foreigners (Hook 1979:178)

The two verb entries for *mil* differ in (a) choice of the subject/external argument and (b) in the lexical case. The first of the two entries is particularly interesting. The dative-marked goal in (6a) refers to a non-volitional participant, so that the ‘meet by accident’ is not really distinct from the ‘get’ sense. The goal referent has no particular control over the event: In contrast, the subject in (6b), with structural nominative case, is unspecified. The person who meets someone by prearrangement is acting volitionally, though some who resembles another is not.

These two entries also differ in aspectual properties. The first entry ‘get, meet by accident’ very clearly is a type of achievement: an event with an natural endpoint but no internal stages save the culmination, and perhaps the resulting state (of possession, for example, in the ‘get’ sense). It is also characteristic of achievements that the referent of the external argument, typically human, has no direct control over whether the end-point is reached or not.

2. Verbs of propositional attitude

The verbs of this class denote mental relations between an individual and a proposition. The canonical complement is a tensed clause (introduced by *ki*, but some of these verbs allow infinitive complements (controlled PRO), or small clauses, with Exceptional Case Marking. Two of the verbs (*sooc* ‘think’, *jaan* ‘know’) have ergative subjects in the right conditions, one allows the ergative *-nee* (*samajh* ‘understand, consider’)

- (1) *us-nee kyaa sooc-aa [ki kaun aa-eegaa]?*
 3s-ERG what think-PF that who come-FUT.
 ‘Who did he/she think [e will come]?’

- (2) *pulis sooc rahii hai [ki coor kaun hai]*
 police think PROG is that thief who is
 ‘The police are thinking about/wondering [who the thief is e]

- (3) *woo [PRO jaa-nee]-kii /-koo sooc rahaa hai*
 3s go-INF -GEN-F/DAT think PROG is-3SM
 ‘He is thinking of [PRO going]’.
- (4) * *woo [un-kaa jaa-nee]-kii /-koo sooc rahaa hai*
 3s 3pl-GEN go-INF -GEN-F/DAT think PROG is-3SM
 ‘He is thinking of [their/them going]’.
- (5) *woo [apnee bhaaii -koo paRhaakuu] samajhtaa/samjh-aa/*sooc-aa*
 3s self’s brother-DAT nerd consider-IMPF/PF think-PF
 He considers/considered.thought [self’s brother a nerd]
- (6) *us-nee jaan-aa [ki ab mujhee[PRO usee paisaa dee-naa] nahiiN aa-taa hai*
 3s-ERG know-PF that now I-DAT 3s-DAT money give-INF not come-IMPF
 ‘He knew(perfective)/jumped to the conclusion [that I wan’tst going to give him any money’

maan-naa

3. Verbs of perception

This class includes verbs of seeing, hearing, perceiving (mentally). The class consists of some verbs which take ergative subjects and corresponding ones which take dative subjects. They share basic stems and/or meanings

- (7) a. (Ergative subject) *deekh* ‘see’, *sun* ‘hear’ *sooc* ‘think, perceive’
 b. (Dative subject) *dikhaaii dee* ‘be visible’, *sunaaii dee* ‘be audible’,
sujh ‘be clear, visible, come to mind’
 c. (Causative) *dikhaa* ‘show’ *sunaa* ‘recite to’ *sujhaa* ‘suggest’

At first glance, the classes (7a) and (7b) seem as different as the subject experiencer verbs in English frighten/fear, be afraid of which Pesetsky (1995) analyzes as having a different structures; a CAUS morpheme is part of frighten, but not of fear. This explanation seems unlikely as an account of the difference of case between (7a) and (7b), since the causative formations with the *-aa* causative morpheme have other meanings (7c), Furthermore, there is evidence that dative experiencers are subjects, just like nominative and ergative subjects. Reflexives, expressed *apnee (aap)* ‘self’ require a subject antecedent, and this requirement is met by dative as well as other non-nominative subjects (Davison in press).

The verb pairs in (7a,b) are oriented to the same subject argument:

- (8) *maiN yah taaraa nahiiN deekh sak-taa /paa-yaa*
 I-NOM this star not see be-able-IMP/ manage-PF

‘I can’t see this star/ din’t manage to see this star’.

- (9) *maiN -nee yah taaraa nahiiN deekh-aa (hai)*
 I-ERG this star not see-PF is

‘I didn’t see/ have not seen this star’.

- (10) *mujhee yah taaraa dikhaaiii nahiiN diyaa/ dee paa-yaa*
 I-DAT this star sight not give-PF give manage-PF

I didn’t see/get a glimpse of this star’.

The three sentence (8)-(10) refer to the same situation; in all cases, the reasons for non-success could be the eyesight or the instruments of the subject reference, the surrounding conditions --fog, bad visibility etc.-- or the size of this particular star. If there were a difference among the three sentences in whether the experiencer is a subject or not, then subject-oriented auxiliaries like *sak*, *paa* ‘be able, manage’ should have different orientations. For example, the ‘ability’ auxiliary should be oriented to the experiencer in (8) or (9), but to the stimulus in (10), which controls the agreement, if there were such a difference of experiencers as subjects vs objects.

The difference seems not to be in the theta roles of the subject, but rather in the completeness of the event.

Another explanation is based on the difference of subject case. If the dative *-koo* is required, then the subject has the experiencer theta role, entailing the absence of volition. By contrast, ergative subjects marked by the *-nee* postposition must refer to agentive NPs. There is some support for this idea, in that the dative subject verbs do seem to have just involuntary experiencer subject ‘see, hear, perceive in the mind’, while the ergative subject verbs allow not only these meanings but also ‘watch, listen, think over’ which are acts which can be done volitionally.

One of the striking features of the Hindi/Urdu lexicon is that some verb stems have many meanings, depending on the case or category of the complement, while certain meanings can be expressed with a variety of verb stems and associated case forms, which have a common core of meaning though they can refer also to distinct situations. An example of the former are the verb *sooc* ‘think, think of, inquire, plan’, and example of the the second type is the meaning ‘SEE’, which can be expressed by the

ergative subject verb *deekh* ‘see, watch, look at’ and *dikhaaii dee/paR* ‘give/fall appearance’, meaning ‘see, seem, appear’. There are situations in which the two expressions are equivalent, other where they do not overlap.

Lexical entries for predicates (verbs and complex predicates especially) have to specify information which relates the predicate to both the syntax and semantics of the clause in which the predicate is situated. There has to be right number and category of arguments, both optional and obligatory, they must have the right case-marking and they must appear in the correct hierarchical relation, for subject selection and c-command of arguments. The arguments and their case have to correlate with the semantic relations among arguments for stable and consistent interpretation of the sentence. Hindi-Urdu, a SOV language, offers some interesting problems in defining this lexical information. In this paper, I explore representative predicates of several classes of transitive predicates: experiencer predicates, predicates of perception and propositional attitudes and verbs of motion, in comparison with standard agentive transitive predicates. I will be concerned with case marking (structural or related to semantic roles), definition of an external argument or subject, and aspectual properties. I take the position that there is no direct correlation between semantic roles and case or hierarchical position. Nevertheless, related predicates may differ in case, category of object and aspectual properties while retaining the same semantic roles and hierarchical organization, especially the designation of the external argument or subject.

Predicates have somewhat broader meaning than their corresponding English translations. For example, a verb of propositional attitude (1) may have different translations in English depending on the category of complement:

- (1) a. sooc ‘think, think about’ (state/activity) NP (exp) CP (theme)
 b. sooc ‘think of (control verb) (activity) NP (exp) IP-kii (genitive)

Perception verbs may have semantic dative case on the experiencer or structural nominative/ergative:

- (2) a. dikhaaii dee ‘see, glimpse’, achievement NP (exp) -koo (dat) NP (source)
 (nom)
 b. deekh ‘watch, look at, see’ NP (exp) nom/erg NP (theme/source)
 (activity, accomplishment)

The basic situation and relation of participants are the same in (2a,b) by the tests of anaphor binding and the orientation of the auxiliary *sak* ‘be able’. But the predicate array in (2a) conveys instantaneous perception, while the one in (2b) conveys sustained perception with temporal duration. However, some instantaneous telic perception verbs

like pahcaan ‘recognize’ refer to acts not under the voluntary control of the perceiver, but are lexically coded like agentive transitive verbs. Local lexical contrasts express differences of duration and telicity.

- (3) a. pahcaan ‘recognize’ (achievement) NP (exp) -nom/erg NP (source)
 b. piiT ‘beat’ (activity) NP (Agent)-nom/erg NP (theme)

Characterizing ergative case as a ‘dependent structural case’. Marantz (1991) and Bittner and Hale (1996a,b) propose a special category of structural case including the ergative, which are assigned only if some other structural case is assigned to another argument. We see that the distinctions of the classes (1)-(2) vs (3-4) follows from this characterization. The verbs in (1) -(2) assign a structural case to a direct object, and the subject has ergative case. In class (3), the object has a structural case, but the subject has lexical case, the dative, associated with experiencer/goal theta role. Crucially in (5), a lexically cased object (4) is combined with the nominative subject. Since the object is not structurally cased, the subject cannot be ergative.

An explanation for case dependency. The dependency of structural cases requires a deeper explanation, which (for this language) arises from a closer look at class (4) and the VP projections the different verb classes. (5) consists of (a) psychological predicates (source, experiencer) and (b) motion to/from a goal. All of these verbs are related either to a causative/transitive verb with an ergative subject (6), or to a nominal. The explanation, therefore, is that the (5) class verbs have the structure (7), without any projection for assigning structural case. They are ‘unaccusative’ verbs which require movement to TENSE for nominative case checking. These verbs occur independently, but most of them are ‘sub-events’ of transitive causative verbs (Pustejovsky 1995) (10), which project ASPECT within VP and CAUSE/DO. Denominal verbs (8) incorporate a N which is case-licensed internally. The structures (7) and (8) can assign only lexical case to additional arguments. Achievements in (1) and (2) have an ASPECT projection, following Travis (1997). This projection over the internal VP (10) which licenses a subject and checks object structural case. Ergative subject verbs, therefore, are verbs which have (at least) the ASPECT projection assigning structural case to the inner argument adjacent to the verb, assuming a lexical case is not assigned to the subject which precludes ergative case.

Implications. The learning problem is therefore reduced considerably to a generalization about VP structure. The unmarked state of affairs is that ergative structural case is possible for subjects in VPs arrays in which an object has structural case (licensed by ASPECT). The contrast with (4) follows from the learning of the related causatives and nominals.

(7) = (5)	(9) = (6)
VP	VP
PP V’	DP V’
DP[Nom] V[-case]	ASP-P V [DO/CAUSE]

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‘Dependent structural Case’ as a consequence of VP structure.

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