

Causative Derivations in Hindi

Rajesh Bhatt and David Embick
University of Texas at Austin and University of Pennsylvania

Draft of Fall, 2003; Please do not cite/distribute without consulting authors

Contents

1	Introduction	2
1.1	Basic Patterns	2
1.2	Assumptions	2
1.2.1	Architectural Assumptions	3
1.2.2	Semantic Assumptions	5
1.3	Outline	8
2	Hindi Verbal Structures and Root Types	8
3	Transitivity Alternations and Directionality	14
3.1	Transitivity Alternations in Hindi	17
3.2	The Structures in the Alternations	21
3.3	Differences between the AA- and NULL-classes?	24
3.4	<i>Basicness</i> and <i>Directionality</i>	26
4	Further Causative Derivations: Unergatives and the ‘Ingestive’ Verbs	31
4.1	Unergatives	31
4.2	Ingesto-Reflexives	37
5	The Indirect Causative	42
6	Allomorphy of Causative Heads	47
6.1	Realization of <i>v</i> Heads in Hindi	47
6.2	Optionality in Causatives between <i>-aa</i> and <i>-v-aa</i>	51
6.3	Realization of <i>v</i> in Kashmiri	52
7	Appendix: Verbs in the Transitivity Alternations	55

1 Introduction

1.1 Basic Patterns

The first set of causative derivations that we will examine are of the type often referred to as *causative/inchoative* alternations, or, more generally, a type that shows a *transitivity alternation*. An initial class of verbs showing a transitivity alternations is illustrated in (1). In this class of verbs, there is no overt causative affix in the transitive form (b). The phonological form of the intransitive is derived from the phonological form of the transitive via a process which we will refer to as *vowel simplification*:

- (1) a. Jaayzaad bāt rahii hai.
property divide PROG-FEM be-PRES
'The property is dividing.'
b. Ram-ne jaayzad bāāt dii.
Ram-ERG property divide GIVE-PERF
'Ram divided the property.'

Because this class involves no overt affixes in either member of the alternation, we will refer to it as the NULL-class.

A second class involves an overt affix, *-aa*, which appears in the transitive member of pairs in which the intransitive shows no overt affix. The transitive form in such pairs also undergoes the process of *vowel simplification* mentioned in reference to the NULL-class above; these facts are illustrated in (2):

- (2) a. Makaan jal raha hai.
house.M burn PROG.M be.Prs
'The house is burning.'
b. Ḍakaitō-ne makaan jalaa diyaa.
bandits-ERG house.M burn GIVE-PERF.M
'Bandits burned the house.'

Verbs alternating in this way belong to what we will call the AA-class. In addition to appearing in the transitive forms of verbs in the AA-class, the causative exponent *-aa* appears in some further contexts, including (1) transitives of what appear to be unergatives, and (2) ditransitives of a particular class of transitives. These latter two cases are examined in detail in §3.

In addition to the NULL- and AA-classes derivation, which involve what is often called 'lexical' causativization, there are causatives with the affix *-vaa*, which have an *indirect causative* interpretation. The *-vaa* causative is illustrated in (3):

- (3) zamiindaar-ne (Ḍakaitō-se) makaan jal-vaa diyaa.
landlord-Erg bandits-Instr house.M burn-CAUS GIVE-PERF.M
'The landlord had the house burned (by the dacoits).'

Here or below, terminological note concerning 'transitive', 'causative', and so on.....

1.2 Assumptions

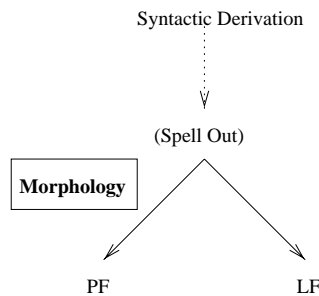
The discussion of causative derivations below is framed against a set of background assumptions that we now present.

1.2.1 Architectural Assumptions

Our analysis of these verbal alternations in Hindi will be framed against a set of background assumptions from the framework of Distributed Morphology (Halle and Marantz 1993 and subsequent work). Although specific assumptions from this framework as the discussion of the Hindi facts takes place below, we clarify now some of the basic architectural premises of this framework.

A primary architectural premise of Distributed Morphology is that word formation is syntactic; this assumption is one that this approach shares with other syntactic treatments of morphology, such as Baker (1988) and Pesetsky (1995). In the default case, morphological structure is simply syntactic structure— that is, nodes arranged in a hierarchical structure. Further operations relevant for word formation occur after spell out, i.e. at PF. We use the term *Morphology* to refer to a sequence of operations that occur on the PF branch. In this way, morphology is a set of operations that interpret the output of the syntactic derivation. The architecture of this approach is presented in (4):

(4) The Grammar



The approach assumes further that there is no *Lexicon*, that is, no non-syntactic system for building complex objects out of primitives. Rather, all derivation of complex objects occurs in the syntactic derivation.¹

There are two types of terminal nodes in the syntactic derivation. One type, the *Roots*, are members of the open-class or ‘lexical’ vocabulary of the language. These are represented as e.g. $\sqrt{\text{DOG}}$. The other, non-Root, terminals are *functional heads*. In the syntactic derivation, the functional heads are *abstract morphemes*; that is, they consist of abstract features like [past] for past tense, or [pl] for Plural. After the syntactic derivation, phonological content is added to these abstract functional heads in a process that is called *vocabulary insertion*. *Vocabulary insertion* is a process that adds phonological *exponents*— including \emptyset — to abstract morphemes. Abstract features and phonological exponents are paired in *vocabulary items*. For example, English contains the vocabulary item in (5), which adds the phonological exponent /-z/ to the node #[pl], i.e. to the # ‘Number’ head with the feature [pl] for ‘Plural’:

$$(5) \quad \#[\text{pl}] \leftrightarrow /-z/$$

Vocabulary items like (5) are rules, whose function is to add phonological exponents to abstract morphemes.

Moving on to issues that are important for our study of causative derivations, the grammatical architecture that we have outlined above motivates a particular approach to verbal alternations of the type we discuss in this paper. There is no *Lexicon* in which the derivation of e.g. a transitive verb from an underlyingly intransitive verb— or the derivation of an intransitive from a transitive—

¹There is also a role for some operations in the PF component that create complex objects; as these are not relevant to the present discussion, we will not examine them here.

can take place. This point has two important consequences for studies like that to be undertaken here. The first point is that what there is to say about verbal alternations is syntactic— that is, on the features and structures that appear in a particular verbal alternant. In this way, the approach that we develop is related to the research program in argument structure associated with Hale and Keyser (1993) and subsequent work, in which argument structure is syntactic. The second point is that there is no possibility of stating a ‘lexical’ vs. ‘syntactic’ dichotomy in trying to explain the properties of causative derivations. That is, it is not possible to treat transitivity alternations as occurring in the Lexicon, while (Indirect) causatives are treated in the syntax. In many accounts, the AA- and NULL-class of alternating verbs are simply not treated together with the *-vaa* causatives. The reason for this is that in Lexicalist approaches, the AA- and NULL-classes would be treated as lexically derived alternations involving merely (de-)transitivization, while the *-vaa* causative is taken to be syntactic. In a theory that has no Lexicon, this sort of distinction clearly cannot be maintained.² We demonstrate below that the exclusively syntactic approach to causativization is superior to a two-module or Lexicalist alternative.

While the architecture we assume has no *Lexicon* in the sense of Lexicalist approaches to grammar, there are nevertheless components of the grammar which list unpredictable information. For instance, the Vocabulary, which contains the vocabulary items, is one such list. The grammar of an individual language also contains a list of the Roots and the abstract morphemes that serve as syntactic terminals in that language. A further list, and one that is important for our concerns in this paper is a list which is called the *Encyclopedia*.³ The information listed in the Encyclopedia concerns the idiosyncratic or non-compositional meanings of objects, whether the objects in question are simplex (i.e. Roots), or syntactically complex (i.e. idioms). So, for instance, the fact that the Root $\sqrt{\text{DOG}}$ in English has something to do with canines and not something else is a matter of Encyclopedic knowledge. Similarly, the fact that the syntactically created object *kick the bucket* has potentially a special meaning that is something similar to ‘die’ is listed in the Encyclopedia. Because this list refers to objects that have been composed in the course of the syntactic derivation, it is accessed at a post-syntactic stage, i.e. an interpretive stage subsequent to the stages of the grammar represented in (4).

A further aspect of Encyclopedic knowledge concerns whether or not a Root denotes an eventuality that is inherently associated with an Agent or not; for this point, see in particular Marantz (1997), which builds on Chomsky (1970). To take specific example which we discuss in detail in §2, we take it that one thing that speakers know about Roots like $\sqrt{\text{CUT}}$ is that the eventuality denoted by this Root involves an Agent, whereas with e.g. $\sqrt{\text{GROW}}$ this is not the case. This type of Encyclopedic knowledge about Roots is independent of the grammatical environments in which these Roots occur. Thus, for instance, $\sqrt{\text{GROW}}$ may be interpreted agentively if it is merged syntactically with the agent-licensing syntactic head $v[\text{AG}]$: *John grows apples*. The crucial point is that there are two notions of agentivity here, Encyclopedic and grammatical, and these must be kept distinct from one another.

By making this distinction between Encyclopedic and grammatical notions of Agentivity, our approach to verbal structures departs from a commonly held view of the relationship between syntax and argument structure. This alternative view is the view of *Projectionism*, which holds that the initial syntactic representation of a verb is derivative of that verb’s lexical semantics. The syntactic projection of this verb is derivative of rules that effect a mapping between the lexical semantics and the syntax, referred to as (*lexical*) *mapping rules*. One of the principal goals of *lexical mapping*

²See Embick (1996) and Miyagawa (1998) for some related discussion in the domain of the relationship between transitivization and causativization.

³See, for instance, Marantz (1997).

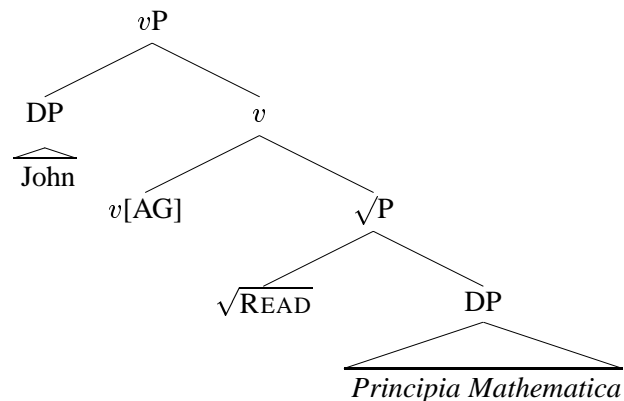
theories in the domain of argument structure has been to predict the syntactic configuration in which a verb appears on the basis of the lexical semantics of the verb.⁴ In the non-lexicalist framework that we assume here, there is no sense in which a syntactic structure can be said to be projected from an individual Root. Questions about how the semantic properties of Roots relate to the syntactic configurations and alternations that these Roots appear in are thus cast in a different light, as we discuss in §3.

1.2.2 Semantic Assumptions

A further set of assumptions that we must clarify concerns the licensing of arguments, and in particular the status of external arguments. A well-developed line of research in the syntax/semantics interface has advanced the position that external arguments have a ‘special’ status. In particular, Marantz (1984) argues that external arguments are not arguments of the verb, but are instead assigned a thematic role by the VP (see also Chomsky (1981)). Since the external argument is not included with other arguments of the verb, a natural development of Marantz’s position is the idea that it is licensed by additional functional structure, and not the verb itself; see e.g. Marantz (1997), where this aspect of external arguments figures prominently in the analysis of nominalizations. The semantic side of external argument-licensing is formalized in Kratzer (1993,1996), who provides a specific semantics for external arguments as DPs licensed in the specifier of a ‘Voice’ functional head. A similar position is advanced in Hale and Keyser (1993). In addition, a number of morphosyntactic works have argued for a head associated with transitivity or the licensing of external arguments.⁵

Syntactically, we assume with the works cited above that external arguments originate in the specifier of a functional head. This functional head is a type of *v*, which we refer to as *v*[AG], as it is the ‘agent-licensing’ head.⁶ The initial *v*P of a transitive sentence like *John read Principia Mathematica* is given in (6):

(6) Transitive *v*P



Having clarified these initial assumptions about the licensing of external arguments, let us now consider how simple transitive structures like (6) are interpreted. We ignore the structure below the VP level to sidestep for now the question of the semantics of (verbal) roots. Following the semantic treatment proposed by Kratzer, we assume that the semantic composition proceeds as follows.

⁴A particularly clear statement of this project is provided in Pesetsky (1995) and Levin and Rappaport (1996).

⁵See, for instance, Harley (1995), Hale and Platero (1996), Embick (1996), Jelinek (1998) **CHECK last**.

⁶The [AG] part of this is notational, with the important point being that this head licenses an external argument, independently of what ‘role’ is associated with that argument. Strictly speaking, not all external arguments are ‘agents’..

- (7) a. $\llbracket \text{read Principia} \rrbracket = \lambda e_s [\text{read}(e, \text{Principia})]$
 b. $\llbracket v[\text{AG}] \rrbracket = \lambda x_e \lambda e_s [\text{Agent}(e) = x]$
 c. Event Identification, (a), (b):
 $\llbracket [v[\text{AG}] [\text{read Principia}]] \rrbracket =$
 $\lambda x_e \lambda e_s [\text{Agent}(e) = x \wedge \text{read}(e, \text{Principia})]$
 d. Introduction of External Argument:
 $\llbracket [\text{John } [v[\text{AG}] [\text{read Principia}]]] \rrbracket =$
 $\lambda e_s [\text{Agent}(e) = \text{John} \wedge \text{read}(e, \text{Principia})]$

The licensing of external arguments in this manner applies in simple transitive clauses and unergatives. One of our primary lines of research in this paper is the idea that the licensing of external arguments in this fashion is a defining feature of (sentential) causatives as well. It is clear that the licensing of an (additional) external argument is a basic component of all forms of causativization. Abstracting away from many details, there is one Agent relation introduced in the (a), and two in the causative (b):

- (8) a. John ate the apples.
 b. Mary made John eat the apples.

It seems that the simplest situation would be one in which $v[\text{AG}]$ was the only element that licensed agents. That is, the null hypothesis should be that causatives– which at a basic level simply involve the addition of an ‘extra’ external argument– involve $v[\text{AG}]$ just like normal transitives do.⁷ The null hypothesis factors out agent-licensing as a common component of transitivization and causativization, but it does not involve an identification of transitivization and causativization. The following discussion shows that causativization (as opposed to transitivization) involves the introduction of two events and the assertion of a ‘cause’ relationship between them.

Some simple considerations demonstrate that something beyond the semantics of $v[\text{AG}]$ offered above is required in the analysis of causatives. The semantic mechanisms that we have introduced above for the licensing of external arguments in transitives produce interesting results when we consider the addition of an extra $v[\text{AG}]$. Consider more complex structures which involve immediate recursion on vP .

- (9) $\dots[vP \text{ XP } [v' v[\text{AG}] [vP \text{ YP } [v' v[\text{AG}] [vP \dots\dots\dots]]]]]$

If we apply the mechanism of semantic composition exemplified in (7) to (9), we get a peculiar result which is shown in (10).

- (10) **Structure:** $\dots[vP \text{ John } [v' v[\text{AG}] [vP \text{ Bill } [v' v[\text{AG}] [vP \text{ read Principia}]]]]]$

Interpretation: $\lambda e_s [\text{Agent}(e) = \text{John} \wedge \text{Agent}(e) = \text{Bill} \wedge \text{read}(e, \text{Principia})]$
 equivalent to: $\lambda e_s [\text{Agent}(e) = \text{John} = \text{Bill} \wedge \text{read}(e, \text{Principia})]$

If we assume that an event can have only one agent, (10) is immediately anomalous. According to (10), two distinct individuals are simultaneously the agent of a single event. In addition, (10) requires that *Bill* and *John* be identical. The conclusion that we draw from this discussion is that simplex verbal structure– that is, a structure in which there is a single event– do not involve recursion on $v[\text{AG}]P$.⁸

⁷The idea that causativization results from the addition of a Verb, and its corresponding argument, is a component of syntactic approaches to causatives, such as Baker (1988) and REFS.

⁸Hale and Keyser (1993) discuss a restriction of this type as well.

A further implication of the discussion surrounding (10) centers on causatives. Above, we put forward the idea that the most basic component of causativization involves the addition of a (second) $v[AG]$ head. The considerations discussed immediately above suggest that while this treatment might be adequate syntactically, something further is required in the semantics to derive an interpretation for a structure with multiple instances of $v[AG]$.

Consider again the recursed vP structure:

$$(11) \quad \dots[_{vP} \text{ XP } [_{v'} v[AG]_2 [_{vP} \text{ YP } [_{v'} v[AG]_1 [_{VP} \dots\dots\dots]]]]]]$$

While $v[AG]_1$ can clearly combine via the rule of Event Identification introduced above, this cannot be the case for $v[AG]_2$. If Event Identification occurred in the latter case, the result would be an event with two Agents, something which we are assuming is not well-formed. This problem does not directly arise if $v[AG]_2$ does not have a syntactically specified external argument. Nevertheless we want to distinguish between the ordinary transitive structure in (12a) and the causative structure in (12b).

- (12) a. transitive, one $v[AG]$ head:
 $\dots[_{vP} \text{ YP } [_{v'} v[AG]_1 [_{VP} \dots\dots\dots]]]$
 b. causative, two $v[AG]$ heads:
 $\dots[_{vP} \text{ XP } [_{v'} v[AG]_2 [_{vP} v[AG]_1 [_{VP} \dots\dots\dots]]]]]$

The intuition that we have in mind is that each $v[AG]$ head introduces a new event, which cannot be identified with an event introduced by another $v[AG]$ head i.e. event identification is blocked when a $v[AG]$ head takes a complement headed by another $v[AG]$ head.

The semantic interpretation that we are after for structures of the form shown in (11) is shown below:

(13) **Structure:** $\dots[_{vP} \text{ John } [_{v'} v[AG]] [_{vP} \text{ Bill } [_{v'} v[AG]] [_{VP} \text{ read Principia}]]]]]$
Interpretation: $\lambda e_s [\text{Agent}(e) = \text{John} \wedge \exists e'_s [\text{CAUS}(e, e') \wedge \text{Agent}(e') = \text{Bill} \wedge \text{read}(e', \text{Principia})]]]$

This interpretation can be derived by assuming a syncategorematic rule that applies in cases where event identification cannot apply. This syncategorematic rule would existentially quantify over the embedded event argument and introduce a *cause* relationship between the event argument introduced by the higher $v[AG]$ and the embedded event argument. Alternatively, we can assume following Pylkkänen (2002) that structures like (11) involve a covert CAUSE head with the semantics shown in (14).⁹

$$(14) \quad \dots[_{vP} \text{ XP } [_{v'} v[AG]_2 [\text{CAUS } [_{vP} \text{ YP } [_{v'} v[AG]_1 [_{VP} \dots\dots\dots]]]]]]]$$

$$[[\text{CAUS}]] = \lambda f_{st} \lambda e_s \exists e'_s [\text{CAUS}(e, e') \wedge f(e')]$$

Based on data from Japanese adversity causatives and Finnish desiderative constructions which she argues involve causation but no external causer, Pylkkänen (2002) argues for the separation of the licensing of the external argument of a causative (if any) and the presence of a causative component in the semantics. She further notes that languages differ in whether the CAUS head can appear by itself (non-voice bundling languages: Finnish, Japanese) or whether it must be accompanied by an external argument-licensing head (voice-bundling: English). The facts concerning causativization in Hindi suggest that Hindi would be in Pylkkänen (2002)'s terms a voice-bundling language.

⁹The semantic proposals made here extend without any modification to structures like (12b), where the embedded $v[AG]$ head does not have an external argument.

With this semantic machinery in place, we can see that across simple transitives and causatives, the process of licensing external arguments is uniformly taken care of by v [AG] heads. Beyond this, the manner in which these v [AG] heads combine with their complements involves different interpretive rules - Kratzerian event-identification in the case of transitivization, and the CAUS head/its syncategorematic version together with two instances of Kratzerian event-identification.

What emerges from these considerations is a treatment of the licensing of external arguments that applies both in transitives and in causatives. This uniform treatment accounts for the fact that in many languages- including Hindi- identical morphology is found with both transitivization and causativization. This approach is uniformly syntactic, and cannot be stated in the same way in an approach that assumes a Lexicon/syntax division.

1.3 Outline

The discussion of the paper centers on structural analyses of the derivations illustrated above, along with some further derivations to be introduced below, as well as on the manner in which the affixes *-aa* and *-vaa* relate to these structures. §2 presents an introduction to verbal structures in Hindi. Our analysis in §3 begins with an examination of the transitivity alternations found in (1) and (2).

In §4 we examine further derivations in which there is a causative head realized by *-aa*. These involve the formation of transitives from putatively unergative verbs, and the formation of ditransitives from transitives in a class of verbs often referred to as *ingestives*.

§5 addresses questions concerning the structure of the *-vaa* causative. While the *-vaa* causative is often taken to be the causative of a transitive, along the lines of *John made Bill read the book*, there is some evidence to suggest that *-vaa* causatives have properties in common with passives. We present a number of arguments below showing that the head realized as *-vaa* actually selects a passive complement; that is, a structure with an agent-licensing v -head, but no agent.

A final point of interest in our analysis concerns the manner in which the exponents associated with causative derivations, and more generally verbal structures in Hindi are realized. These issues are addressed in §6 under the rubric of a discussion of the allomorphy of verbal heads in Hindi and Kashmiri.

2 Hindi Verbal Structures and Root Types

The status of elementary verbal structures in Hindi must be clarified before we proceed to the analysis of the structures underlying the AA- and NULL-classes of alternating verbs. The basic nucleus of the Hindi clause is composed of the functional projections v , ASP for Aspect, and T for Tense. The head v was discussed earlier in the context of the licensing of Agents, something we associate with v [AG]; other types of v are discussed below. The heads ASP and T contain different features, such as T[past] for Past Tense T, ASP[prog] for the Progressive feature on ASP, and so on.

In Hindi basic clauses the progressive, habitual, and perfect tenses have a finite auxiliary, which is a form of the verb *be*:

- (15) a. Present Progressive:
 Jaayzaad bāt rahii hai.
 property divide PROG.FEM be.PRES.3SG
 ‘The property is dividing.’
- b. Present Habitual:
 yahā: peṛ roz kaṭ-te hē.
 here tree.m everyday cut-Hab.MPI be.PRES.3SPI

‘Trees are cut everyday here.’ (Lit. Trees cut everyday here.)

c. Present Perfect:

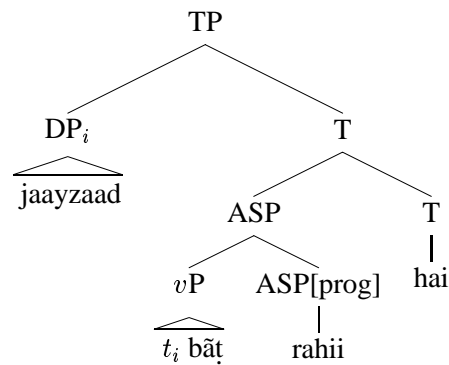
yahā: aaj do peṛ kaṭ-e hĒ
 here today two tree.m cut-Pfv.MPI be.PRES.3PI

‘Two trees have been cut here today.’ (Lit. Two trees have cut here today.)

The past progressive/habitual/perfect can be obtained from the examples in (15) by replacing the present tense auxiliary by the past tense auxiliary.

In terms of the basic clause structure we have outlined above, the structure of (15a) is as in (16); the internal structure of the *vP* is left abstract, as this is the topic of the following section:

(16) Verbal Structure (Progressive)



The structures for (15b, c) are similar to the structure for the progressive shown in (16) with the exception that the aspectual component is provided not by a freestanding element like *rahaa* in the progressive, but by a bound habitual/perfective morpheme that appears on the main verb. This difference between (15a) and (15b, c) could be taken to show (15b, c) involve V (= $\sqrt{\text{ROOT}}-v$) to Asp movement, while in (15a), *v* stays within the *vP*.

When an auxiliary appears in T in the Hindi verbal system, it cooccurs with the Progressive, Habitual, or Perfect participles, which are of course unmarked for tense. Thus these basic clauses in Hindi shown in (15) involve an *analytic* verbal forms– that is, they consist of a finite auxiliary and a non-finite form of the main verb.

Not all tense-aspect combinations involve a finite auxiliary. The simple past, the subjunctive, and the future do not involve a finite auxiliary.

(17) a. Simple Past:

Mona kal aa-ii
 Mona.f yesterday come-Pfv.f

‘Mona came yesterday.’

b. Subjunctive:

shaayad Mona aa-e
 maybe Mona come-Sbjv.3Sg

‘Maybe Mona will come.’

c. Future:

Mona zaruur aa-egii
 Mona.f definitely come-Fut.3FSg

‘Mona will definitely come.’

The subjunctive and the future involve a shared substructure in Hindi - the future consists of subjunctive morphology together with an additional participial component. We take the subjunctive and the future to be features generated in T. When these features are present, the $\sqrt{\text{ROOT-}v}$ complex moves to T. Since there is no overt evidence for aspectual marking and semantically the subjunctive/future seem to be aspectually unspecified, we take it that the subjunctive/future lacks an aspectual projection.

As for the simple past, two options seem plausible. The first is to assume that the $\sqrt{\text{ROOT-}v}$ complex remains in ASP, and that T[past] is spelled out as $-\emptyset$. The second assumes that the $\sqrt{\text{ROOT-}v\text{-Asp}}$ complex does in fact move to T[past]. In Hindi, the verb in the simple past has the same form as the perfect participle, but this is not the case in the closely related Indo-Aryan language Kashmiri. The crosslinguistic evidence from Kashmiri therefore supports the idea that the Hindi simple past involves movement of the $\sqrt{\text{ROOT-}v\text{-Asp}}$ complex to T[past].

As we have noted, the $\sqrt{\text{ROOT-}v\text{-Asp}}$ complex does not in general move to T. There is a terminological question concerning whether this object should be considered morphosyntactically ‘verbal’ or not. There are (at least) two notions of *morphosyntactically verbal* that are potentially relevant. On the one hand, it is often asserted that only things that combine with – i.e. form a complex head with– (finite) Tense are morphosyntactically verbal. Structures that fail to combine with Tense are assigned other labels, e.g. ‘participle’. On the other hand, there is a sense in which a complex that does not combine with Tense can be regarded as morphosyntactically verbal– specifically, if it involves a Root that is combined in a complex head with *v*, the verbalizing functional head.¹⁰ These two definitions are as follows:

- (18) Notions of ‘verbal’
- a. **Verbal1:** Combines with (finite) Tense.
 - b. **Verbal2:** Combines with *v*.

Clearly these two definitions are related. According to standard assumptions, the syntactic objects that combine with Tense in the sense defined above contain *v*. Nevertheless, the definitions pick out different objects. For instance, in *John kicked the apples*, *kicked* is Verbal1 and Verbal2. In *John has kicked the apples*, on the other hand, *kicked* is Verbal2, but not Verbal1, as it is *has* that is Verbal1.

As we have implied above, the matter is purely terminological, so there is no sense in which one notion of Verbal is more correct than the other. Our reason for pursuing it to this level of detail is because there is a potential confusion concerning what it means to be ‘verbal’. This is important because there is a significant theoretical matter concerning the notion of Verbal2 in Hindi. In order to clarify the terminology, let us define the Roots in Hindi that combine with *v* as *v-Roots*. We now put forth the following observation:

- (19) The set of *v-Roots* is extremely restricted in Hindi.

That is, the set of Roots that can combine with *v* (Verbal2 above) in the first place is sharply circumscribed.¹¹

This observation is a component of a larger pattern. While the set of *v-Roots* is restricted, the language nevertheless contains the means of introducing new Roots into the verbal system. It does this with structures containing light-verbs:

¹⁰Other definitions are also conceivable. For example, a Hindi-internal test for verb-hood involves the ability to combine with aspectual and infinitival morphology.

¹¹More precisely, we are not making an observation about the cardinality of the set of *v-Roots*. Our observation is that the set of *v-roots*, the set of *n-roots*, and the set of *a-roots* is essentially disjoint, and while it is relatively straightforward to introduce novel *n* and *a-roots*, the same is not true of *v-roots*.

- (20) a. kamraa saaf thaa
 room.MSg clean be.Pst.MSg
 ‘The room was clean.’
- b. kamraa saaf ho rahaa hai
 room.MSg clean be Prog.MSg be.Prs.MSg
 ‘The room is becoming clean.’
- c. Lalji kamraa saaf kar rahaa hai
 Lalji room clean do Prog.MSg be.MSg
 ‘Lalji is cleaning the room.’

We take it that (20a) and (20b) involve a stative and inchoative version of v respectively; for convenience let us refer to these as $v[B]$. In the typical case stative $v[B]$ is realized as $-\emptyset$, while the inchoative $v[B]$ realized overtly as a form of be . Given the absence of aspectual morphology, we assume that an AspP is not projected in (20a).¹² The minimal structures associated with be and do are a simple (predicative) intransitive structure and a simple transitive structure with $v[AG]$, as in (21) and (22) respectively:^{13,14}

¹²There are some cases in which the stative $v[B]$ seems to have an overt realization.

- i. Habitual:

yeh kamraa har subah saaf ho-taa hai
 this room.m every morning clean be-Hab.MSg be.Prs.3Sg

Generic Stative: ‘This room is clean every morning.’

Generic Inchoative: ‘This room is cleaned every morning.’

The ambiguity of (i) suggests that the generic operator realized by aspect can have either a stative or an inchoative complement. The availability of a generic stative reading might be taken to show that sometimes stative $v[B]$ can be realized overtly. We believe that this conclusion is premature. An alternative that allows us to preserve the intuition that stative $v[B]$ is realized by $-\emptyset$, and inchoative $v[B]$ by an overt form of be involves (postsyntactic) insertion of be under Asp⁰. This could be seen as a form of be -support. Under this alternative the two readings of (ii) would correspond to the distinct structures in (iii).

- iii. a. Generic Stative:

... [AspP [vP [aP...]] v[B](= $-\emptyset$)] Asp⁰(=Hab)] T⁰ ...
 Postsyntactic: ... [AspP [vP [aP...]] v[B](= $-\emptyset$)] **BE**+Asp⁰(=Hab)] T⁰ ...

- b. Generic Inchoative:

... [AspP [vP [aP...]] v[B](=BE)] Asp⁰(=Hab)] T⁰ ...
 After Head Movement: ... [AspP [vP [aP...]] t_{BE}] **BE**+Asp⁰(=Hab)] T⁰ ...

We now return to the asymmetry between (20b) and (ii). The reason only an inchoative reading is available in (20b) is related to the semantics of the progressive. The progressive in Hindi, as in many other languages, cannot combine with states. The inchoative option is the only one available. In contrast, the generic can combine with both events and states yielding the observed ambiguity.

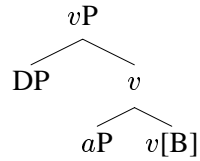
A similar contrast holds between the perfective and the future, with the perfective only allowing inchoative readings and the future allowing both stative and inchoative readings. The explanation offered in the main text for the contrast between (20b) and (i) extends to explain the contrast between the perfective and the future.

¹³We assume that in the transitive the light verb *kar* ‘do’ is the spell out of $v[AG]$. Whether or not $v[B]$ is present in the transitive, as we have it here, is an open question. Works such as Hale and Keyser (1998) propose that such a head is present in intransitives. This position has been challenged by Pyllkkänen (2002). If it is not present, some questions arise concerning the structure of $v[AG]$ ’s complement, and this might affect the treatment of *kar*.

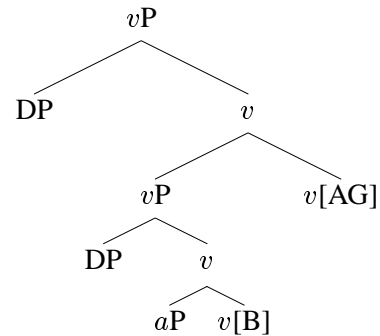
¹⁴It is clear in the light-verb cases that the structure involves an aP and not a Root, as the aP can contain a comparative complement:

- (1) a. AP:

(21) BE structure



(22) DO structure



Our reason for introducing the light-verb structures above was that these structures are necessary when certain Roots enter the verbal system. The interesting thing about the light-verb cases when compared to the basic verbs seen above is that there is no overlap between these two categories. There is, for instance, no possibility of merging $\sqrt{\text{SAAF}}$ ‘clean’ directly with *v*, making it a *v*-Root; it can only appear in the light-verb structure. This state of affairs contrasts with the situation in English, where there is an alternation between analytic (light-verb) and synthetic expression of alternations for the same type of Root:

- (23) a. John’s face turned red.
 b. John’s face reddened.

Assuming that *turn* is a light-verb, i.e. a spell-out of *v*, and that *-en* is the spell out of *v* as well, the *vP* structures for (23) are as follows:¹⁵

yeh sarak [[us sarak]-se chaurii] hai
 this road.f that.Obl road-than wide.f be.Prs.3Sg

‘This road is wider than that road.’

b. AP + *be*:

yeh sarak [pehle-se chaurii] ho ga-yii hai
 this road.f before-than wide.f be GO-Pfv.f be.Prs.3Sg

‘This road has become wider than before.’

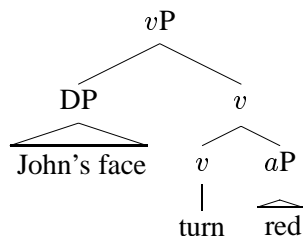
c. AP + *do*:

PWD-ne [is sarak]-ko [pehle-se chauraa] kar di-yaa hai
 PWD-Erg this.Obl road-Acc before-than wide do GIVE-Pfv be.Prs

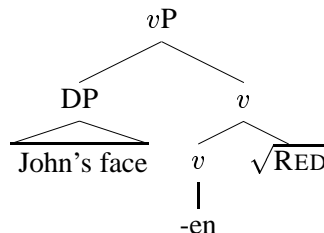
‘The PWD (Public Works Dept.) has made the road wider than (it was) before.’

¹⁵See Hale and Keyser (1993, 1998) for ‘de-adjectival’ formations. See also Embick (to appear) for some discussion.

(24) Analytic



(25) Synthetic



The fact that an *aP* appears in the case with the light-verb *turn* is clear from the fact that *red* can be modified—*John's face turned completely red*.

In English there are analytic and synthetic alternants for Roots like $\sqrt{\text{RED}}$ and many other Roots. The morphosyntactic analysis of this type of pattern involves different types of Root-derivation. That is, the Root $\sqrt{\text{RED}}$ may combine either with *a* or with *v*. More generally, there are numerous cases in English in which the same Root appears in different categories by virtue of being merged directly with distinct category-defining functional heads. For instance, Roots like $\sqrt{\text{VAPOR}}$ can combine with *n*, *v*, and *a*, yielding *vapor-Ø*, *vapor-ize*, and *vapor-ous*.

In Hindi, on the other hand, there is evidently no Root-derivation of this type. For instance, none of the Roots in the NULL- or AA-classes occur as Root-adjectives like *saaf* above. Rather, a modifier that is based on such a Root contains *v* and ASP heads, and is a 'participle'.

Notably, such participial modifiers based on *v*-Roots do not pattern with Root-adjectives with respect to how they combine with inchoative *v*[B]. We have already seen that Root adjective like *saaf* 'clean' combine with *v*[B] to yield an inchoative interpretation (cf. 20). This option is unavailable to derived participial modifiers:

- (26) a. kamraa khul-aa hai
 room.m open-Pfv.MSg be.Prs.3Sg
 'The room is open(ed)/has opened (at least once).'
- b. Cannot combine with inchoative *v*[B]:
 *kamraa khul-aa ho rahaa hai
 room.m open-Pfv.MSg be Prog.MSg be.Prs.3MSg

The ungrammaticality of (26b) (compare with the acceptable (20b)) reflects the semantic incompatibility between inchoative *v*[B] and the derived participial modifier. Inchoative *v*[B] can only take a pure stative as a complement. The derived participial modifier is a stative, but not a pure stative and hence it cannot combine with inchoative *v*[B].¹⁶

To summarize, there are consistent sets of derivational possibilities for different classes of Roots. Since the different Root classes we have in mind are characterized by which category-defining head the Root may be merged with, the different classes may be labelled along the lines of our term *v-Root*— i.e., as *n*-Roots and *a*-Roots. If it is true that the Hindi Root system is sharply partitioned along these lines, then some very specific predictions emerge. For instance, for a *v*-Root, the only nominals/adjectives that can be derived with this Root must have a *v* in the substructure; this was illustrated with the Participial Modifier vs. Adjective distinction above. Similarly, the only verbal

¹⁶For an explanation of this restriction on the combination of Inchoative *v* with Resultative participles see Embick (to appear).

forms available for *a*- and *n*-Roots must involve verbalizing in addition to *a* and *n*, i.e. the light-verb structures we have examined above.

Although we cannot investigate the Root-category correlation in Hindi in detail here, it deserves a few comments before we proceed. There seems to be a basic difference in morphosyntactic type at play in this domain, with languages allowing relatively frequent Root-derivation on the one hand, and languages like Hindi with canonical relationships between Roots and a single category-defining head on another. This matter is significant, because it is difficult to see how the position that Roots are category-neutral could be established on the basis of the Hindi data. It is clearly the case that the Root-types identified above could be treated as ‘basic’ Verbs, Nouns, and Adjectives. Since the category-neutral approach to Roots has significant motivation, it could simply be assumed that this is the only universal option. This is the assumption that we make here. Nevertheless, there is an important question concerning whether or not this pattern truly holds in Hindi across the board, and, if so, a further question concerning why languages should differ so much in terms of the distributional requirements that they impose on Roots.

3 Transitivity Alternations and Directionality

The AA- and NULL-classes of verbs illustrated in the first section enter a transitivity alternation that is often called the *causative* or *causative/inchoative* alternation. This the type of alternation found with e.g. English *break*, which appears both in Intransitive (*The vase broke*) and Transitive (*John broke the vase environments*). In this alternation, the subject of the intransitive is interpreted as undergoing the action– that is, in the same way that the object of the transitive is– so that this type of alternation is seen as involving an unaccusative intransitive paired with a causative transitive.

Again, why this is supposed to be lexical, and what we have to say about it

The syntactic treatment of transitivity alternations that we propose here is grounded in assumptions that stem from the treatment of nominalizations presented in Chomsky (1970) and Marantz (1997). Marantz (1997) demonstrates that Chomsky’s analysis in *Remarks*– a paper that is regarded as the source of Lexical approaches to grammar– is in fact an argument against Lexicalism; that is, against theories with a generative Lexicon. In addition, Chomsky (1970) and Marantz (1997) sketch a treatment of transitivity alternations that has direct implications for the analysis of alternating verbs in Hindi. Because these assumptions figure crucially in our approach to this alternation, we summarize the Chomsky/Marantz argument here before proceeding to an examination of Hindi.

The topic of Chomsky (1970) is the relationship between the sentences (a) with the *derived nominals* (b) and the *gerundive nominals* (c) in sentences like (27-28):

- (27) a. John refused the offer.
b. John’s refusal of the offer...
c. John’s refusing the offer...
- (28) a. The Romans destroyed the city.
b. The Romans’ destruction of the city...
c. The Romans’ destroying the city...

Chomsky argues that while gerundive nominals are derived from the sentential source by transformation, derived nominals are derived through what he calls an *extension of the base*. The *extension of the base* solution meant that the categorial rules of the base– rules like NP → Det N– become generalized across the lexical categories N, V, and A. Each of these lexical categories is introduced

by a single rule schema, in which a head takes a complement and a specifier. Because these rules of the base are the same for the ‘lexical’ categories N, V, and A, these labels can be replaced by the variable X; the result is the X^l-schema.

In the case at hand, this means that a derived nominal like *the refusal of the offer* is formed when a category neutral Root $\sqrt{\text{REFUSE}}$ appears with a complement via the rules of the X^l-schema, and subsequently becomes a ‘noun.’ Crucially, derived nominals are not formed from verbal structures. That is, there is no sense in which the derived nominal ‘refusal’ is derived from the Verb ‘refuse’; rather, both are derived from the same category-neutral Root, $\sqrt{\text{REFUSE}}$.

A further aspect of Chomsky’s discussion is centered on the status of Roots that exhibit a transitivity alternation, like $\sqrt{\text{GROW}}$, whose behavior as a derived nominal is of particular interest. Roots like $\sqrt{\text{GROW}}$ appear in both transitive and intransitive variants. However, $\sqrt{\text{GROW}}$ is incapable of appearing as a transitive in the derived nominal; it can only appear as an intransitive (as a gerundive nominal, it can be either transitive or intransitive). In this way, $\sqrt{\text{GROW}}$ differs from e.g. $\sqrt{\text{DESTROY}}$ (recall *The Romans’ destruction of the city* above):¹⁷

(29) Clauses

- a. The tomatoes are growing.
- b. John is growing the tomatoes.

(30) Derived nominals

- a. The growth of tomatoes...
- b. *John’s growth of tomatoes...

The question is why $\sqrt{\text{GROW}}$, unlike e.g. $\sqrt{\text{DESTROY}}$, should disallow a transitive nominalization like (30b), despite the fact that this Root can appear as a transitive verb, as in (29b). Chomsky argues that the ungrammaticality of (30b) follows directly if $\sqrt{\text{GROW}}$ can only be interpreted with an agent in a syntactic environment that contains a [+CAUSE] feature— that is, if this Root is not inherently ‘agentive’, but can only become agentive in causative syntax.¹⁸ Derived nominals are, as noted above, not formed from verbal structures. Because the derived nominal is not formed from a verb, the feature [+CAUSE], which is verbal in nature, cannot be present. It then follows that $\sqrt{\text{GROW}}$, which can only be interpreted agentively (transitively) when [+CAUSE] is present, cannot be interpreted agentively in the derived nominal. As Marantz stresses, Chomsky’s arguments show that the transitive form of *grow* cannot be created in the Lexicon. If transitive *grow* appeared in the Lexicon, and word-formation rules like those creating derived nominals from verbs also occurred in the Lexicon, then nothing but an explicit stipulation could block the derivation of (30b). According to the syntactic solution, on the other hand, the restriction follows naturally as long as one assumes that $\sqrt{\text{GROW}}$ is not Encyclopedically agentive— i.e., that such Roots require syntactic structure in order to be transitive.

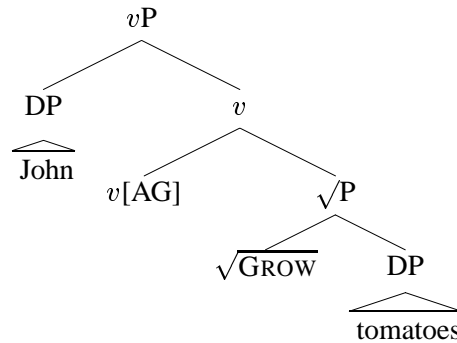
The treatment of transitivity alternations that emerges from the *Remarks* arguments is one in which transitivity is syntactic; this is updated in Marantz (1997), where it is combined with the idea that external arguments are licensed by functional structure, not by the verb itself (recall §1). On the updated version of this analysis of alternating Roots like $\sqrt{\text{GROW}}$, the idea is that Root $\sqrt{\text{GROW}}$ can only be interpreted agentively when it appears with *v*[AG] (cf. Marantz 1997):

¹⁷It could be that *destroy* is bimorphemic, i.e. a prefixed Root; for simplicity, we represent it as simplex here.

¹⁸In this argument Chomsky (1970) follows earlier treatments of transitivity alternations, in particular Lakoff (1965)

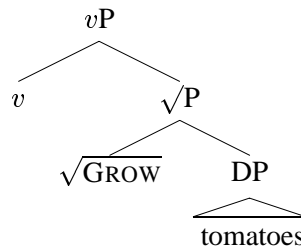
Check date.

(31) Transitive *grow*



Intransitive *grow*, on the other hand, occurs in a structure with another type of *v*, one which does not license an external argument. To a first approximation, this is presented in (32), where the *v* that verbalizes the structure does not license an external argument (i.e. is not *v*[AG]):

(32) Intransitive *grow*



There are, of course, many further questions about this structure, concerning the nature of this *v* head and its complement. It is also possible that different classes of alternating verbs appear in different structures, as has been proposed by Hale and Keyser (1993,1998) and related work. These questions are addressed below. The crucial point for the moment is that the arguments summarized above provide substantial motivation for the assumption that the derivation of transitives is syntactic— that is, that there is no derivation of transitives from intransitives (or vice versa) in a Lexicon. Rather, transitivity or intransitivity are structural notions that refer to properties of the syntactic environment in which category-neutral Roots appear.

Before we proceed to Hindi, a few further comments are in order concerning an aspect of the Chomsky/Marantz argument that requires that there be different classes of Roots. The argument reviewed above relies crucially on the idea that Roots like \sqrt{GROW} are unlike Roots like $\sqrt{DESTROY}$. The latter are capable of being interpreted agentively outside of the syntactically ‘verbal’ environment. Thus in the derived nominal environment, where there is no *v*[AG], $\sqrt{DESTROY}$ can still be interpreted agentively, such that possessors like *the Romans* in *The Romans’ destruction of the city* can be interpreted as the agent of the destruction. This difference between \sqrt{GROW} and $\sqrt{DESTROY}$ is a difference between the *Encyclopedic semantics* of these Roots. As we noted in §1, the Encyclopedia is a part of the grammar in which non-compositional meanings about Roots (and complex expressions like idioms) is listed. In the case at hand, the difference must be that $\sqrt{DESTROY}$ -type Roots Encyclopedically denote eventualities that are agentive, while \sqrt{GROW} -type Roots denote eventualities that do not contain an agent Encyclopedically.

It seems that these properties of Roots relate to the behavior of Roots in alternations, although this seems to be subject to cross-linguistic variation. Marantz (1997) suggests that the Encyclopedi-

cally agentive semantics of $\sqrt{\text{DESTROY}}$ leads to an incompatibility with intransitive verbal syntax. Unlike $\sqrt{\text{GROW}}$, $\sqrt{\text{DESTROY}}$ cannot appear as an intransitive.¹⁹

- (33) a. *The city destroyed.
 b. The Romans destroyed the city.

With respect to this behavior there seems to be variation across languages. In Hindi, it appears that many verbs that are Encyclopedically agentive can appear in intransitive syntax.²⁰ However, it seems that in Hindi the Encyclopedic semantics of the Root correlate in part with morphological behavior, in a way that we articulate below.

To summarize, we take the Chomsky/Marantz argument summarized above to be an argument for a syntactic approach to transitivity alternations. As a final point, we wish to stress that the Encyclopedic classification of Roots discussed above in terms ‘agentive’ versus ‘non-agentive’ Roots is not a syntactic classification. Crucially, it is a matter of how the Roots are categorized Encyclopedically. There is no sense in which Roots like $\sqrt{\text{GROW}}$ or $\sqrt{\text{DESTROY}}$ are ‘basically intransitive’ or ‘basically transitive’, as long as we understand ‘transitive’ and ‘intransitive’ syntactically. Rather, these Roots have certain Encyclopedic properties, and what syntactic environment they can go in is a different question. More generally, a further implication of this view is that the commonly posed question about whether the transitive or intransitive variant in transitivity alternations is more ‘basic’ is ill-formed, a point that we discuss below in §3.3.

3.1 Transitivity Alternations in Hindi

We begin our analysis of Hindi transitivity alternations with some basic facts about the AA- and NULL-classes of alternating verbs, examples of which are repeated here:

- (34) NULL-Class
- a. Jaayzaad bāt rahii hai.
 property divide PROG-FEM be-PRES
 ‘The property is dividing.’
- b. Ram-ne jaayzad bāāt dii.
 Ram-ERG property divide GIVE-PERF
 ‘Ram divided the property.’
- (35) AA-Class
- a. Makan jal rahaa hai.
 house.M burn PROG.M be.Prs
 ‘The house is burning.’
- b. Ḍakaitō-ne makaan jalaa diyaa.
 bandits-ERG house.M burn GIVE-PERF.M
 ‘Bandits burned the house.’

The examples in (34) and (35) show an alternation involving *v*-Roots, in this case $\sqrt{\text{BĀĀṬ}}$ ‘divide’ and $\sqrt{\text{JĀL}}$ ‘burn’. Such alternations are of course superficially similar to the light-verb alternations involving ‘be/become’ and ‘do’ seen in §2, a point that we return to below.²¹

¹⁹See also Levin and Rappaport (1995:102 sqq.), building on Smith (1970).

²⁰This pattern is also discussed in the context of St’át’cets (Lilloet Salish); see Davis (2000).

²¹The verb *diyaa* ‘give’ in (35a) has a different status than the *be* or *do* in the light verb alternations examined above. It appears to be the head of an Aspectual morpheme...**did we remove the discussion of this?** See §2.

An initial set of questions concerns the exact nature of the intransitives found in examples of this type. Because the list of alternating verbs in the AA- and NULL-classes (cf. the Appendix) contain many Roots that cannot appear intransitively in languages like English, the status of the intransitives in (34-35) requires careful examination. Using diagnostics that we introduce below, it can be shown quite clearly that all of the intransitives we have presented above, whether in the AA-class or the NULL-class, are unaccusatives and not passives.²²

As an initial step in this argument, let us consider (36):

(36) a. Intransitive:

peṛ kaṭ rahe hẽ
trees.M cut Prog.MPI be.Prs.PI

‘Trees are cutting_{intr.}’ (i.e. Trees are being cut.)

b. Transitive:

kampani peṛ kaṭ rahii hai
company.f tree cut Prog.f be.Prs

‘The company is cutting trees.’

Our position is that in addition to lacking a syntactically projected external argument, intransitives like (36a) also lack any grammatically represented agentivity. In terms of our assumptions concerning the syntax of external arguments, this means that (36a) does not contain $v[AG]$, while (36) does. In this way the unaccusative differs from the passive. While the passive does not syntactically project an external argument, it does involve agentivity, which we associate with the presence of the head $v[AG]$.²³

The distinctions at play here are subtle, as a result of the Encyclopedic semantics of some of the verbs that enter this transitivity alternation in Hindi. Roots like \sqrt{CUT} are, in many languages, associated with Agentive semantics, and are not found as unaccusatives; consider English **The bread cut*. In Hindi, Roots of these type are perfectly capable of appearing in unaccusative structures.²⁴ Because Roots like $\sqrt{KAAṬ}$ still have a strong agentive component even in Hindi, a truth-conditional difference between the intransitive (36a) and the passive (37) is not easy to detect based on interpretation alone.²⁵

(37) peṛ kaṭ-e jaa rahe hẽ
trees.M cut-Pfv.MPI PASS Prog.MPI be.Prs

‘Trees are being cut.’

With other verbs like *ubal* ‘boil’, whose Encyclopedic semantics are not inherently agentive, the truth-conditional difference between the intransitive and the passive of the corresponding transitive verb is easier to detect (cf. 38):

²²The presence of some unergatives in an alternation involving the exponent *-aa* is discussed in §4.1.

²³For the licensing of Agentivity (and Agents) via a head like $v[AG]$, see Kratzer (1994, 1996). For the approach to the passive as involving a $v[AG]$ but no external argument see Embick (1997, 2001).

²⁴Similar problems have been discussed in other languages that form unaccusatives from verbs that involve Encyclopedic agentivity; see, for instance, Davis (199x) on Stat...

²⁵This is not to deny that there is an interpretive difference, just that it can be quite subtle. A suitable comparison from English would be something like the difference between the Middle and the Passive, as in *This fish cuts easily* vs. *This fish is easily cut*. The semantics are once again quite close; but while the passive licenses agentivity syntactically, this is not believed to be the case with the Middle (cf. Bhatt and Pancheva (2002) for a recent review of the literature on Middles).

- (38) a. Intransitive:
 paanii ubal rahaa thaa
 water boil Prog.M be.Pst.M
 ‘The water was boiling.’
- b. Transitive:
 Amit paanii ubaal rahaa thaa
 Amit.M water.M boil Prog.M be.Pst.M
 ‘Amit was boiling the water.’
- c. Passive:
 paanii ubaal-aa jaa rahaa thaa
 water boil-Pfv PASS Prog.M be.Pst.M
 ‘The water was being boiled.’

For the passive (38c) to be judged true, someone has to be boiling the water. There is no such requirement in the intransitive (38a).

The difference in Encyclopedic semantics that we appealed to above is somewhat complex, a matter that we return to below. Fortunately, we are not limited to truth-conditions in distinguishing between unaccusatives and passives. There are also a number of syntactic diagnostics that distinguish between these structures, to which we now turn.

A first diagnostic centers on the licensing of *-dwaaraa* ‘by’-phrases. These are found with passives, but not with unaccusatives:²⁶

- (39) a. paanii (Ram-dwaaraa) ubaal-aa jaa rahaa thaa
 water Ram-by boil-Pfv PASS Prog.M be.Pst.M
 ‘The water was being boiled by Ram.’
- b. paanii (*Ram-dwaaraa) ubal rahaa thaa
 water Ram-by boil Prog.M be.Pst.M
 ‘*The water was boiling by Ram.’

²⁶Instrumental *-se*-phrases are, however, possible with unaccusatives.

- i. mujh-se anjaane-me/*jaan-buujh-kar gamlaa tuuṭ gayaa
 I.Obl-Instr unknowingly/*deliberately pot break_{intr} GO-Pfv
 ‘Unknowingly, the pot broke by me.’

Although this superficially appears to go against the diagnostics employed in this section, which suggest uniformly that our ‘unaccusatives’ lack agents, it can be shown that the problem is only apparent and that the *se*-phrase in an unaccusative is not agentive. The *-se*-phrase in (i) displays none of the standard properties of demoted agents of passives in Hindi (see Mahajan (1995) for details). It cannot be used volitionally (cf. i) and it cannot control into adjunct clauses (cf. ii).

- ii. a. */???mujh-se khaate-khaate gamlaa tuuṭ gayaa
 I.Obl-Instr while-eating pot break_{intr} GO-Pfv
 ‘*While eating, the pot broke by me.’
- b. */???mujh-se [ghar aa-kar] gamlaa tuuṭ gayaa
 I.Obl-Instr home come-having pot break_{intr} GO-Pfv
 ‘*Having come home, the pot broke by me.’

We take these facts to suggest that the *-se*-phrase is an manner/means adjunct and not related to a syntactically present agent.

An additional observation is that certain non-finite adverbial adjuncts that target the agent are possible in transitives and their passives but not with the corresponding unaccusative intransitives.²⁷ The non-overt subject of the non-finite adverbial adjunct is controlled by the implicit agent of the passive in (40,41a). There is no agent in the unaccusative (40,41b). The PRO subject of the non-finite adverbial adjunct therefore does not have a suitable controller and (40,41b) are deviant:

(40) a. Passive:

haNste haNste peṛ kaṭ-e jaa rahe hẽ
laughing laughing trees cut-Pfv.Pl PASS Prog.Pl be.Prs.Pl

‘The trees are being cut by someone who is laughing.’

b. Intransitive:

*khaate khaate peṛ kaṭ rahe hẽ
eating eating trees cut Prog.Pl be.Prs.Pl

(41) a. Passive:

khaanaa khaa-kar peṛ kaṭ-aa jaa rahaa hai
food eat-having tree cut-Pfv PASS Prog be.Prs

‘The tree is being by cut by someone, that someone having eaten food.’

b. Intransitive:

*khaanaa khaa-kar peṛ kaṭ rahaa hai
food eat-having tree cut Prog be.Prs

²⁷This point concerning the presence of agentivity in the passive and its absence in the corresponding unaccusative intransitive is sometimes also made through agentive adverbs such as *jaan buujh-kar* ‘deliberately’ (cf. Hook (1979), pg. 178).

i. a. Passive:

pyaaliyā: jaan buujh-kar toṛ-ii jaa-tii hẽ
cups.f deliberately break_{tr}-Pfv.f PASS-Hab.f be.Prs.Pl

‘The cups are being broken on purpose.’

b. Unaccusative:

#pyaaliyā: jaan buujh-kar tuṭ jaa-tii hẽ
cups.f deliberately break_{intr} GO-Hab.f be.Prs.Pl

‘#The cups break on purpose.’

We have not used agent-oriented adverbs as a diagnostic because their distribution does not seem to be directly correlated with the syntactic representation of agentivity (cf. ii).

ii. thermostat jaan buujh-kar low-par hai
thermostat deliberately low-on be.Prs.Sg
‘The thermostat is on low intentionally.’

It is not clear that (ii) involves syntactically represented agentivity and yet an agentive adverb is licensed. The diagnostic of non-finite adverbial adjuncts that we use is not subject to the same confound - cf. the ungrammaticality of (iii).

iii. #haNste haNste thermostat low-par hai
laughing laughing thermostat low-on be.Prs.Sg
‘#While laughing, the thermostat is on low.’

For some discussion of these facts with reference to the presence of a syntactic agent in the English passive, see Williams (1985), Lasnik (1988), and Embick (1997).

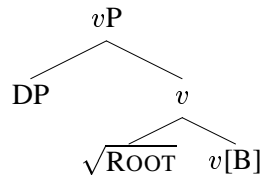
Thus while the difference between passive and unaccusative syntax for Roots like $\sqrt{\text{KAAṬ}}$ is difficult to articulate based on purely semantic grounds, it can be illustrated quite clearly using the diagnostics in (40) and (41).²⁸

3.2 The Structures in the Alternations

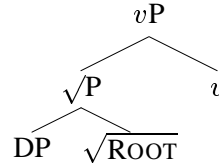
To this point we have established that the AA- and NULL-classes involve unaccusative and transitives. Determining precisely what the structures of the intransitive and the transitive are leads to some further questions of interest, and illuminates several difficulties. The simple fact of the matter is that the structures that are associated with verbal alternations like the causative/inchoative alternation are quite small. As a result, standard syntactic tests are difficult to apply.

Our approach to the structures found with the alternating verbs involves a direct comparison with the light-verb cases discussed above. To begin with, either one of the following possibilities could be appealed to as the structure of an unaccusative (as in §2 above, $v[\text{B}]$ in the first tree indicates v with features related to B(e)/B(ecome)):

(42) ‘Inchoative’ Type



(43) Alternative Type



The first structure here is that often associated with ‘inchoative’ type verbs, i.e. those often thought of as *deadjectival*, like e.g. *redden* in English (see Hale and Keyser (1993,1998)). The second type has a non-agentive version of v and no external argument. There are arguments in the literature to the effect that these structures (and perhaps some further variants) are both found in the same language, and one possibility that must be considered is that each of these is found in Hindi as well.²⁹

Turning to the other half of the alternation, there is the question of the transitive structure, along with the question of whether the structure that is found in the unaccusative case also potentially determines the structure of the transitive. A simple assumption is that the transitives we have examined simply involve a $v[\text{AG}]$ and a DP agent addeed to the structure found with the unaccusative.

²⁸There is also a related syntactic difference between passives and unaccusatives. The subjects of Hindi passives allow for retention of accusative case (i.b). This possibility is unavailable with intransitives (i.c).

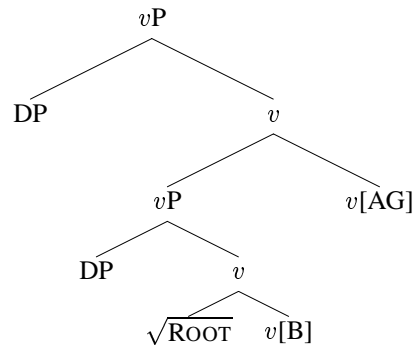
- i. a. Ayush us per-ko kaṭ rahaa hai
Ayush.M that.Obl tree.M-Acc cut Prog.MSg be.Prs.Sg
‘Ayush is cutting that tree.’
- b. vo per/us per-ko kaṭ-aa jaa rahaa hai
that tree/that.Obl tree-Acc cut-Pfv PASS Prog be.Prs
‘That tree is being cut.’
- c. vo per/*us per-ko kaṭ rahaa hai
that tree/that.Obl tree-Acc cut_{intr} Prog be.Prs
‘That tree is getting cut.’ (lit. That tree is cutting.)

While this pattern is of interest for the study of case in the passive, for our purposes here it suffices as a further manner in which passives and unaccusatives differ from one another.

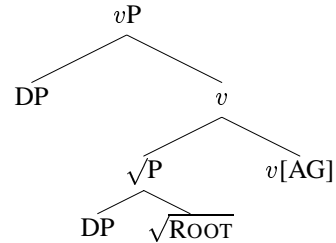
²⁹See, for instance, Hale and Keyser (1998) and Alexiadou and Anagnostopoulou (2001). Also Borer (1991) **CHECK?**.

There are thus the following two transitive structures to consider as well:³⁰

(44) Transitive 1 (cp. (42))



(45) Transitive 2 (cp. (43))



Our approach to the structures of alternating verbs follows closely on the discussion of *v*-Roots in the preceding section. In particular, we wish to consider structures for the AA- and NULL-class verbs along with structures for the *light verb* alternations seen in the last section; this alternation is repeated in (46):

- (46) a. kamraa saaf thaa
 room.MSG clean be.Pst.MSG
 ‘The room was clean.’
 b. kamraa saaf ho rahaa hai
 room.MSG clean be Prog.MSG be.Prs.MSG
 ‘The room is becoming clean.’
 c. Lalji kamraa saaf kar rahaa hai
 Lalji room clean do Prog.MSG be.MSG
 ‘Lalji is cleaning the room.’

Recall that there are no cases in Hindi in which we find pairs like *John’s face turned red* and *John’s face reddened*. In §2, we expressed this fact by saying that there is a set of *a*-Roots in Hindi (along with *n*-Roots and *v*-Roots), whose defining property is that they must combine first with *a*. The Roots that function as *a*-Roots in Hindi all have the semantics canonically associated with the notional category ‘adjective’ – that is, they have the Encyclopedic semantics of simple states.³¹ Let us suppose that the simplest interpretation of this fact is that the Roots that are inherently stative in the relevant way in Hindi cannot combine with *v* (or *n*) directly; rather, they must combine with *a*.³²

³⁰Of course, it is logically possible that the transitives and intransitives combine in different ways, yielding four possible combinations of structures.

It should be noted that other types of assumptions concerning how arguments are licensed delimit the possible structures. For instance, in theory like that presented in Borer (1994,2001, 2003), in which all arguments are licensed in the Neo-Davidsonian fashion, the structure in (43) is not a possibility. In (43) the DP is an argument of the Root, and in Borer’s approach Roots do not take arguments (see also Ramchand (200x)) Additional considerations for an approach in which Roots do not take (even internal) arguments directly are discussed in Williams (2002).

³¹Should we give some examples, or is this more or less acceptable??

³²This statement must, of course, exclude stative *v*-Roots, such as the verb *know* **Rajesh** – presumably we can make this point clearer; that is, that we are talking about Roots like CLEAN, not KNOW (or whatever the stative verbs in H. are) etc..??

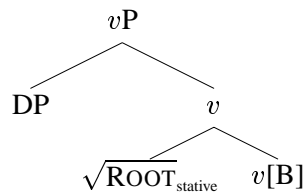
(47) Inherently stative Roots must combine directly with *a*.

Of course, the full range of Root distributions in Hindi requires statements like (47) that cover the *v*- and *n*-Roots as well. The statement for the *v* Roots is given to a first approximation in (48), which of course could be refined into subclasses for e.g. internally versus externally caused (cf. Levin and Rapaport (1995), Marantz (1997), or agentive versus non-agentive (see below), and so on:

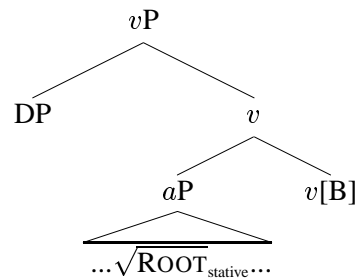
(48) Roots encyclopedically denoting eventualities must combine directly with *v*.

Returning to the inherently stative Roots, the point is that unlike in e.g. English, where Roots of this type like $\sqrt{\text{RED}}$ can combine directly either with *a* (to yield *red-Ø*) or *v*[B] (to yield *redd-en*), the Roots of this type in Hindi are restricted to combining first with *a*. As a result, the only way in which such Roots can enter the verbal system is in an *aP*, which requires the analytic light-verb constructions seen in (46). Using $\sqrt{\text{ROOT}}_{\text{stative}}$ to refer to the relevant Roots, the situation is summarized with reference to the following structures (where hierarchical structure only is represented):

(49) English, *Hindi



(50) English, Hindi



It has been noted above that the structure in (49) figures prominently in Hale and Keyser's (1993,1998) 'deadjectival' formations. The intuition behind this treatment is that the Roots that appears as the complement of *v*[B] are those that typically surface as adjectives, or have the semantics of notional adjectives. In the terms employed above, this means that the structure in (49) is found with Roots that are 'inherently stative'.

This fact about (49), coupled with the strict partition of Roots in Hindi along the lines expressed by (47) and (48), has implications for the analysis of the AA- and NULL-class of alternating verbs. The AA- and NULL-classes are verbal- composed of *v*-Roots. The Roots that appear in these classes cannot form simple 'adjectives'; if they function as modifiers, they are (resultative) participles- which contain a *v* head- and simply cannot appear in a structure in which they combine directly with *a*. There is therefore no reason to assume that the AA- and NULL-classes involve intransitives with the structure in (49). There is substantial motivation for holding that this structure is restricted to inherently stative Roots, and, as we have just discussed, the Roots in the AA- and NULL-classes do not have this property.³³

³³We take it that there is one case in which the AA- and NULL-class Roots do appear as the complement of *v*[B]. This is when they form Resultative participles, and function as modifiers:

- (i) kamraa khul-aa hai
 room.m open-Pfv.MSg be.Prs.3Sg
 'The room is open(ed)/has opened (at least once).'

This construction involves an Aspectual head ASP immediately above *v*[B]. The fact that these Roots may appear

This means that while structures like the Inchoative structures in (42) (and perhaps (44)) exist in Hindi, they are found only with *a*-Roots. If the division between *v*-Roots and *a*-Roots is taken at face-value, in the manner outlined above, then there are actually two correlations to state. There is no evidence that the *v*-Roots appear with Inchoative structures, and, conversely, no evidence that the Inchoative structure ever occurs outside of the light-verb construction.

Our interim conclusion, then, is that the verbs in the AA- and NULL-classes do not appear in the *v*[B] structures illustrated above; these structures are only found with the light verbs. **Therefore...**

A further point, which is discussed in greater detail below, is that there is no evidence to suggest that there is a difference between the AA- and the NULL-classes of transitive verbs. In all of the diagnostics we have employed, whether looking at transitives or at intransitives, the two classes behave identically. It is, of course, difficult to argue for a negative conclusion; in this case, for the conclusion that there is no syntactico-semantic difference between these two classes of verbs. It is shown in the next section that the Encyclopedic semantics of the Roots in the two classes tends to differ. But this is not a distinction that is represented in the syntax. The position that the AA- and NULL-classes do not differ syntactically takes on significance against the background provided by theories that assume that there is a *directionality* to alternations, an assumption to which we now turn.

3.3 Differences between the AA- and NULL-classes?

More specifically, is there any sense in which the AA-class verbs are ‘basically intransitive’, or in which the NULL-class verbs are ‘basically transitive’?

An examination of the meanings of the verbs in each class (cf. the lists in the Appendix) reveals some tendencies in the predicted direction. For instance, many of the verbs in the NULL-class are what one would think of as being Encyclopedically agentive, as in the discussion of *cut* in §2.1 above.

(51) Encyclopedically Agentive in the NULL-class:

bāt-naa ‘divide’
 bandh-naa ‘tie’
 chhap-naa ‘print’
 kat-ṇaa ‘cut’
 lad-naa ‘load’
 pis-naa ‘grind’
 piṭ-naa ‘beat’
 tul-naa ‘weigh’

as the complement of *v*[B] in the participle does not challenge the argument in the text. When a Root appears as the complement of *v*[B], it must be interpreted as some kind of state. For some Roots, this results in coercion (cf. Kratzer (1993), Embick (2003)). In the case at hand, the point is that the fact that *v*-Roots in Hindi can be associated with (target) states when they are merged as *v*[B]’s complement, but this does not make these Roots inherently stative, and it does not mean that these Roots appear as the complement of *v*[B] when they are intransitive.

The participial environment has special properties that set it apart from the system of verbal alternations. In English, for instance, there are many cases in which a Root may appear as a Resultative participle, but not as a simple intransitive:

- (i) a. The metal is hammered.
- b. *The metal hammered.

So there is no correlation between appearing as the complement of *v*[B] in the participle, and being able to appear as the complement of this head in the verbal intransitive.

etc.

We use the term *Encyclopedically Agentive* to refer to those verbs which involve an agent in the Encyclopedic semantics even though such an agent might not be part of the syntactic representation.

We need to be very clear about this, to make it clear that we think this differs from e.g. *break*, which metaphysically requires an agent but probably not encyclopedically.

However, as (52) shows, there are also several verbs in the NULL-class that are not Encyclopedically Agentive in the sense defined above. We will refer to verbs of this type as *Encyclopedically Non-Agentive*. Once again, with the term ‘Encyclopedically Non-Agentive’ we do not mean that the Root meaning is necessarily non-agentive, i.e. incompatible with an agentive interpretation. It just means that the conceptualization of the verb meaning does not require the presence of an agent. Some examples of this type are as follows:

(52) Encyclopedically Non-Agentive verbs in the NULL-class:

gir-naa ‘fall’
ghul-naa ‘dissolve’
mar-naa ‘die’
mur-naa ‘turn’
nikal-naa ‘emerge’
ubal-naa ‘boil’
etc.

The difference between the Encyclopedically Agentive verbs and the Encyclopedically Non-Agentive verbs is similar to the difference between *hit* and *break*.

Of course, in English we can appeal to some diagnostics (e.g. transitivity alternation), behavior as nominal...

There is also a tendency in the Encyclopedic semantics of the Roots that appear in the AA-class. Most of the verbs in this are Not Encyclopedically Non-Agentive:

(53) Non Encyclopedically Agentive verbs in the AA-class:

bah-naa ‘flow’
biit-naa ‘elapse’
chamak-naa ‘shine’
hil-naa ‘rock’
khil-naa ‘bloom’
pak-naa ‘ripen’
pighal-naa ‘melt’
sar-naa ‘rot’
etc.

However, a small class of verbs in the AA-class do seem to be Encyclopedically Agentive.

(54) AA-class, Encyclopedically agentive:

bach-naa ‘save’ bahal-naa ‘entertain’ bichh-naa ‘unroll’

The point to be stressed is that while there do appear to be tendencies in the two classes, they are just that, tendencies, and not exceptionless generalizations. As we have shown, exceptions exist with respect to both the NULL-class and the AA-class. That said, the tendency of the AA-class verbs to be Encyclopedically Non-agentive is quite strong and entertains only a few exceptions. In contrast, the NULL-class has several verbs that are non-agentive.

With the tendencies in Encyclopedic meaning that are found in the two classes at hand, let us turn to questions about possible grammatical differences between the AA- and NULL-classes. The most important point is that there are, in all of the contexts we have examined, no diagnostics suggesting that the two classes are distinct in any syntactico-semantic way. This is an important point, given that according to the SIH above, the default assumption is that there should be some structural or featural difference between the AA- and NULL-classes. In the domain of transitivity alternations, some analyses concentrating specifically on structures like those discussed above have in fact argued that morphological differences in alternating pairs can be reduced directly to structural difference (e.g. Alexiadou and Anagnostopoulou (2001), and related to this Hale and Keyser (1998)). If these approaches are on the right track, then it should be possible in principle to distinguish alternating verbs in terms of something other than morphological form.

As we stressed above, in the present case, no diagnostics suggesting that the two classes are distinct syntactico-semantically have been identified. In spite of whatever uncertainty may remain with respect to this point, the conclusion with respect to directionality-based theories is clear. While there may be tendencies with respect to directionality, these tendencies do not constitute grammatical principles. This does not, of course, mean that there is nothing to be said about the tendencies that are found in the classes. Rather, our position is that there is nothing syntactic to be said about these differences. In terms of how the two classes came into Existence, there are some quite plausible scenarios in terms of diachronic development which might explain why the AA- and NULL-classes are structured the way they are.³⁴

3.4 *Basicness and Directionality*

Our study of this alternation is set against a background in which very specific questions about such alternations have been examined. We begin with a brief overview of these questions, each of which is expanded on below.

Two initial questions that have characterized many treatments of alternations are (1) the question of whether or not a particular verb enters a particular verbal alternation; and (2) the question of whether or not this pattern is predictable. These questions are defined clearly in the research program of lexicalist/projectionist approaches to argument structure, where a defining assumption is that the initial syntactic projection of a verb's arguments is derivative of that verb's lexical semantics. Levin and Rappaport (1995) contains a very clear statement of this position. The results that they derive from their investigation of the causative/inchoative alternation are described as

...a correlation between certain lexical semantic properties, basic adicity, and the argument structure associated with intransitive verbs, where the lexical semantic properties have an explanatory relation to adicity and argument structure. (1995:82)

A related set of questions that has characterized many prior accounts of transitivity alternations concerns *directionality*— whether one form of a verb is derived from another form. In the present domain, this is the question of whether the unaccusative or the transitive is 'basic', with the other alternant being derived from this basic one. While different answers to this question have been

³⁴A related perspective is expressed by Davis (2000), although Davis makes different assumptions about directionality and 'basicness'.

given, the point to be emphasized is that these accounts assume that there is a non-syntactic notion of ‘basic’ to begin with. This assumption is once again quite clear in Levin and Rappaport (1995), who describe their treatment of alternating verbs like *break* in the following terms:

...in terms of its lexical semantic representation the verb *break* of *The window broke* is a dyadic causative verb, just as the verb *break* of *Pat broke the window* is. This analysis departs from the analyses that are typically found in other studies, which assume that the intransitive variant of a causative alternation verb is basic and the transitive variant derived. (1995:83)

A further type of question that implicates directionality is based on morphological form, and in particular on differences in surface morphological differences like those found in the AA- and NULL-classes. It is quite common cross-linguistically to find transitivity alternations in which one of the two verbs is marked with an overt affix; this is illustrated schematically in (55), where -X and -Y represent affixes:

- (55) Schema for Alternations
- a. Intransitive Form: Verb-X
Transitive Form: Verb
 - b. Intransitive Form: Verb
Transitive Form: Verb-Y

Using (55a) for illustration, the idea behind approaches that take directionality at face value would be that in such a class of verbs, the Intransitive is derived from the Transitive via an operation associated with the affix $-X$.

The discussion above has been devoted to establishing a property that is common to both the AA- and NULL-classes of verbs – specifically, the intransitives of each class are some type of unaccusative, and not passive. We now turn to a further question– are the two alternations different in identifiable ways? In posing this question, we begin by reviewing questions concerning *directionality* in verbal alternations, concentrating in particular on accounts that predict that the two classes should be syntactico-semantically distinct on the basis of their morphological patterns. In §2.3 we compare the predictions of directionality-based approaches with an alternative that is provided by the grammatical architecture that we assume here.

As outlined above, a primary assumption of approaches that involve the notion of *directionality* is the idea that there is a ‘basic’ form for any verb, such that alternations involve converting this basic form by some process, typically a lexical rule.

As we noted above, an additional assumption that is found in many studies is that this derivational directionality is revealed by morphological patterns. For instance, an alternating pair in which the intransitive form is X, while the transitive form is X-affix, is classified as showing a *causative* alternation. Haspelmath (1993) studies transitivity alternations from a typological perspective, and provides a number of classifications for the different morphological patterns attested in pairs of alternating verbs. For example, derivations in which the intransitive member is morphologically marked are referred to as *anticausative*, with the transitive form taken to be basic; alternations in which the transitive form is morphologically marked are, as just noted, *causative* derivations, with the intransitive form being taken as basic.³⁵

³⁵Haspelmath also has labels for cases in which both forms are marked, but differently (“equipollent”), and for cases in which neither form is marked, as in English *break/break* (“Labile”).

Although the classificatory system described above is most prominent in the typological literature, the idea that alternations have an inherent directionality, which is what the classifications are meant to capture, is a key component to many theoretical treatments as well. For instance, Davis (199x) discusses a number of views that take either the intransitive or the transitive form as ‘basic’ in alternations of the relevant type. The idea that there could be a direction to an alternation in the first place is characteristic of many *lexicalist* or *projectionist* approaches to grammar. In its simplest manifestation, it takes the form of an assumption like that in (56a), which we dub the *Basicness Assumption*. A second set of assumptions that we will discuss concerns how morphological marking relates to directionality. The point is not always explicitly acknowledged, but a motivating force behind many of these analyses is the idea that the syntactico-semantic direction of the alternation is transparently revealed by the surface morphological directionality. This assumption is presented as (56b).

(56) DIRECTIONALITY OF ALTERNATIONS:

- a. THE BASICNESS ASSUMPTION: A verb has a single, unique argument structure; any instances in which that verb appears with a distinct argument structure are derivative (via operations) of the basic form.
- b. MORPHOLOGICAL MARKING ASSUMPTION: Morphological marking faithfully reflects directionality of derivation, in a way that is essentially iconic— if X and Y are forms of the same Root, and Y has ‘more’ morphology than X, then X is basic.

The pair of assumptions in (56) appear in attempts to understand the implications of morphological patterns in the transitivity alternation for *lexical mapping theories*: approaches which seek to predict the syntactic configurations in which a verb appears on the basis of the lexical semantics of the verb. Viewed from a cross-linguistic perspective, transitivity alternations appear to form a challenge for lexical mapping theories (cf. Davis (199x) for a clear statement of the problem). Transitivity alternations of the type we have examined in this section do not show a uniform direction of morphological marking. That is, within a given language there are often different marking patterns in such alternations, and across languages it appears that the same verbs show different patterns of marking (recall the classifications of Haspelmath noted above). The cross- (and intra-) linguistic variation in morphological markedness in the transitivity alternation challenges the idea that a particular lexico-semantic meaning is universally mapped onto a single basic syntactic configuration. Various solutions to this apparent conflict have been proposed in theories that attempt to maintain the assumption (56a).³⁶

Turning now to the transitivity alternations in Hindi, we can say the following in terms of apparent directionality. In the AA-class, the intransitive form appears to be basic, while the transitive form appears to be derived; this is something that can be stated on the basis of the affixation pattern alone. That is, the intransitive form is unmarked, while the transitive has *-aa*; according to the logic of the classification above, this would be a *causative* alternation, in which the transitive is derived from the intransitive. A further point about directionality is based on phonological diagnostics concerning what the underlying form of the Root must be. In the NULL-class there is no overt affix to appeal to. However, it can be shown on a phonological level that the underlying form of the Root is that associated with the transitive. Thus we will arrive at the following generalizations:³⁷

A goal of Haspelmath’s investigation is to identify which verb meanings show stable patterns of alternation cross-linguistically, and which do not. As Levin and Rappaport (1995:101) note, the ‘survey’ methodology employed by Haspelmath is compromised by the superficial treatment of the data that it involves.

³⁶For instance— All alternating verbs are basically intransitive: Davis (199x),....; All are transitive: Reinhart, etc.

³⁷These generalizations fit squarely with the diachronic facts (cf. Masica (1976:52) 52).

(57) Phonological Underlying Form:

- a. NULL-Class: Underlying form is found in the Transitive
- b. AA-Class: Underlying form is found in the Intransitive

The facts which point to the generalizations in (57) both derive from the operation of a single phonological process, which we refer to as *vowel simplification*. This process operates in both classes of alternating verbs, but in a different way. In the AA-class, it is found in the transitives, i.e. it co-occurs with the overt realization of *-aa-*:

(58) Correspondences: AA-class

Intransitive	Transitive	Gloss	Vowels
jaag-naa	jag-aa-naa	‘wake up’	aa/a
biit-naa	bit-aa-naa	‘elapse/cause to elapse’	ii/i
suukh-naa	sukh-aa-naa	‘dry’	uu/u
ro-naa	rul-aa-naa	‘cry/cause to cry’	o/u
liṭ-naa	liṭ-aa-naa	‘lie/lay’	e/i

A simple argument points to the conclusion that it is the phonological form found in the Intransitive that is underlying in this case. In the transitive, we find an /u/ vowel in both *sukh-aa-naa* and *rul-aa-naa*. In these two forms, this vowel in the transitives corresponds to distinct vowels in the intransitive— /uu/ in the former case, /o/ in the latter. This pattern can be accounted for straightforwardly if it is assumed that the phonological form found in the intransitive is the underlying form, while that in the transitive is derived via *vowel simplification*.

The same argument can be put forward for the NULL-Class, where *vowel simplification* also occurs. In this class, however, it is the stem-form found in the transitive that is the underlying form, while the intransitive stem form is derived via *vowel simplification*. The correspondences in *khul-naa/khol-naa* and *luṭ-naa/luuṭ-naa* parallel the patterns discussed with reference to (58) above:

(59) Correspondences: Ablauting Class

Intransitive	Transitive	Gloss	Vowels
mar-naa	maar-naa	‘die/kill’	a/aa
khul-naa	khol-naa	‘open’	u/o
luṭ-naa	luuṭ-naa	‘be robbed’	u/uu
piṭ-naa	piiṭ-naa	‘hit’	i/ii
ghir-naa	gher-naa	‘surround’	i/e

These patterns can be stated transparently if it is assumed that the form found in the transitive is the underlying form, and that the form of the intransitive is derived from this. If, on the other hand, one assumed that the form of the intransitive were the basic one, with the transitive formed by a lengthening rule, there would be two problems. First, the patterns in (58) could not be stated as simply— something would have to account for the fact that an underlying /u/ would be lengthened to either /uu/ or /o/. Second, the connection between the process seen in the AA-forms, which is clearly the same as that found in the NULL-class, would be severed. In spite of the fact that Vowel Simplification is triggered in different morphosyntactic environments in the two classes, i.e. in transitive forms in the AA-class and in intransitive forms in the NULL-class, it is the same rule. Positing a lengthening rule in addition to a simplification rule would simply miss this generalization.

Further evidence for the claim that the phonological form found with the transitive is basic in the NULL-class comes from a class of verbs which have the same form in both Intransitive and Transitive syntax. If these verbs are assumed to be NULL-class verbs which happen to have a short vowel in the underlying form, then the identity follows from the fact that this vowel simply cannot be further shortened in the derivation of the Intransitive. If, on the other hand, the Intransitive form were basic and subject to lengthening in the Transitive, these verbs would simply be exceptions:

(60) No Change

Intransitive	Transitive	Gloss
badal-naa	badal-naa	‘change’
bun-naa	bun-naa	‘weave’
bhar-naa	bhar-naa	‘fill’
ghis-naa	ghis-naa	‘rub’
rang-naa	rang-naa	‘get colored/color’
sil-naa	sil-naa (sii-naa)	‘sew’

According to our analysis, these are simply well-behaved verbs of the NULL-class, which happen to have a stem-vowel in the underlying form that is not subject to the simplification rule.

Having clarified what appear to be the morphophonologically ‘basic’ forms for the two classes, let us return to the question about directionality. In terms of the assumptions concerning morphological markedness we have outlined above, the following generalizations can be stated. In the AA-class, the presence of the *-aa* affix would indicate that the intransitive form is basic, while the transitive form is derived. No such evidence is available in the NULL-class, because, of course, there is no overt affix. Yet it is possible to refer to the diagnostics we have just outlined for identifying the phonological underlying form. In the AA-class, the underlying form is the form that surfaces in the intransitive; this is clearly consistent with the affixation-based diagnostic. In the NULL-class, the phonological evidence indicates that the form that surfaces in the transitive is the basic form. Based on these arguments, the predictions of an account with directionality are that (1) the AA-class involves verbs that are basically intransitive being converted into transitives, while (2) the NULL-class consists of verbs that are basically transitive, which are converted into intransitives.

In the non-lexicalist architecture that we have assumed in this paper, the notion of ‘basic’ syntactic form required for these predictions is simply not storable. The reason for this is that in our approach, syntactic structures are not projected from Roots in the first place. Rather, syntactic structures are assembled according to the principles of syntax. Thus while Roots appear in syntactic structures, they do not determine these structures. There is therefore no notion of ‘syntactically basic configuration’ for a Root.³⁸

In the place of the assumptions in (56) above, we introduce distinct principles concerning the relationship between the representation of Roots, syntactic structures, and morphological marking. Our approach relies on the distinction between (1) the syntactico-semantic structures that are involved in any particular alternation, and (2) the Roots that appear in those structures. Concentrating on the structures, it is clear that since the only type of derivation that is allowed on our view is syntactic, a notion of syntactico-semantic directionality can be stated quite straight-forwardly in terms of syntactic structures, in the following way:

(61) SYNTACTICO-SEMANTIC DIRECTIONALITY: Structure (=features arranged hierarchically) S is derived from structure S' iff S contains S' as a subcomponent.

³⁸It is possible to refer to a syntactic environment in which a Root typically appears; but this is different from saying that a syntactic structure is actually projected from a Root.

This is a definition of directionality that is completely divorced from morphological patterns. It defines derivational directionality purely in terms of structural complexity, and neither in terms of surface morphological patterns nor in terms of the particular Roots that appear in these structures. The further question is how structure is related to morphological form. On the directionality-based view, this relationship is essentially transparent, and implicates a lexical notion of a ‘basic’ form. Since the only notion of directionality that our approach admits is that in (61), the same position cannot be taken here. In place of (56b) we assume (62), a general principle that covers syntax/morphology interactions:

- (62) STRONGEST INTERFACE HYPOTHESIS: All other things being equal, differences in morphological marking should correlate with syntactico-semantic (i.e. structural or featural) differences.

The SIH represents the assumption that in the default case morphological distinctions will directly reflect syntactico-semantic distinctions. An important point, however, is that there are cases in which syntax/morphology interactions are less direct than (62) would have it. To take a very simple case, contextual allomorphy, such as the distinct *-ed* and *-t* realizations of the feature [past] in the English Tense system, is a difference in morphological marking that does not reflect a structural or featural difference; whether there is a *-ed* or a *-t* phonologically, the syntactico-semantic feature [past] is the same in each case. The idea is that in the default case, SIH holds.³⁹ Thus the null hypothesis for situations like that involving the NULL- and AA-classes is that there is some (structural or featural) difference underlying the morphological difference.

4 Further Causative Derivations: Unergatives and the ‘Ingestive’ Verbs

The data discussed in the preceding section involved derivations with the exponent *-aa*, in which an *aa*-suffixed transitive of a Root was paired with an unaffixed intransitive. In the case of both the AA-class verbs and the verbs of the NULL-class, the intransitives in these alternation examined in §3 are unaccusatives. In this section we move to two further alternations, each of which displays affixation with *-aa*. The first type involves alternations relating an unmarked intransitive and a transitive with *-aa*, but in which the intransitive is an unergative rather than an unaccusative; these are addressed in §3.1. This class is of interest because they raise the question of whether the *v*-head that is realized as *-aa* can take a complement which itself has an external argument. In the second type, covered in §3.2, we examine cases in which *-aa*-affixed ditransitives are paired with unmarked transitives. This class raises a similar question to that involving *-aa* affixation to apparent unergatives, in that it superficially seems to involve a causative *v* attaching to a structure that already has an external argument.

Let’s try to point out here what we’re going to say about these things...

4.1 Unergatives

A number of verbs that appear with the *-aa* suffix as transitives seem to be essentially unergatives when intransitive. Some pairs of this type are given in (63), where we note that the intransitives are verbs that typically behave as unergatives cross-linguistically:

³⁹It is worth noting that the SIH must be paired with an assumption about when there are *syncretisms*, i.e. cases in which the same morphological form is found in distinct syntactico-semantic environments. Superficially SIH resembles the *Principle of Contrast*, a principle assumed by Carstairs-McCarthy (1994) to regulate the distribution of affixes in inflectional paradigms. See Embick and Halle (forthcoming) for some discussion of this approach.

(63) *aa*-Alternations with Unergative Intransitives

Intransitive	Transitive	Gloss
chal-naa	chal-aa-naa	‘move, walk/cause to move, drive’
daur-naa	daur-aa-naa	‘run/cause to run, chase’
ghuum-naa	ghum-aa-naa	‘walk, wander/cause to walk, walk s.t.’
hās-naa	hās-aa-naa	‘laugh/make s.o. laugh’
haṭ-naa	haṭ-aa-naa	‘move/remove’
jhuul-naa	jhul-aa-naa	‘swing/make s.o. swing’
kuud-naa	kud-aa-naa	‘jump/make s.o. jump’
naach-naa	nach-aa-naa	‘dance/make s.o. dance’
ur-naa	ur-aa-naa	‘fly/make s.t. fly’

The impression that the intransitives in (63) are unergative is confirmed by a number of syntactic diagnostics that systematically distinguish unaccusatives from unergatives.

An initial context distinguishing unaccusative and unergative intransitives is the reduced relative environment. Unlike unaccusatives, which allow for the formation of participles that can appear as reduced relatives, unergative verbs cannot form participles that are used in this context:⁴⁰

(64) a. Unergative:

*hās-aa (huaa) larḵaa
laugh-Pfv be-Pfv boy
‘*the laughed boy’

b. Unaccusative:

kaṭ-e (hue) phal
cut_{intr}-Pfv.MPI be-Pfv.MPI fruit
‘the fruits in the cut-state, the fruits that are cut’

A further diagnostic comes from a construction called the *inabilitative*. Unergatives pattern with transitives and not unaccusatives with respect to how they enter into the inabilitative construction: both transitives and unergatives can only appear in the inabilitative construction with passive syntax. Unaccusatives appear in the inabilitative without passive syntax (and in fact cannot be passivized; see immediately below):

(65) Transitive

a. Basic transitive:

Nina-ne dhabbe miṭaa-ye
Nina-Erg stains.MPI wipe-Pfv.MPI
‘Nina scrubbed away the stains.’

b. Inabilitative 1 (based on active syntax):

*Nina-se Mona-ne dhabbe nahī: miṭaa-ye
Nina-Instr Mona-Erg stains.M Neg wipe-Pfv.MPI

c. Inabilitative 2 (based on passive syntax):

⁴⁰The transitive form of the unergative— i.e., the form suffixed with *-aa-* can function as a participial reduced relative; see below.

Nina-se dhabbe mitaa-ye nahī: gaye
 Nina-Instr stains wipe-Pfv.Pl Neg PASS-Pfv.MPI
 Nina couldn't (bring herself to) wipe away the stains.'

(66) Unergative

a. Basic Unergative:

Nina daur̥ rahii hai
 Nina.f run Prog.f be.Prs.Sg

'Nina is running.'

b. Inabilitative 1 (based on active syntax):

*Nina-se Mona daur̥ rahii hai
 Nina-Instr Mona.f run Prog.f be.Prs.Sg

c. Inabilitative 2 (based on passive syntax):

Nina-se daur̥-aa nahī: gayaa
 Nina-Instr run-Pfv Neg PASS-Pfv

'Nina couldn't run.'

(67) Unaccusative

a. Basic Unaccusative:

dhabbe miṭ rahe hē
 stains wipe_{intr} Prog.MPI be.Prs.MPI

'The stains are getting erased.'

b. Inabilitative 1 (based on active syntax):

Nina-se dhabbe nahī: miṭ-e
 Nina-Instr stains.M Neg wipe_{intr}-Pfv.MPI

'Nina wasn't able to wipe away the stains.'

c. Inabilitative 2 (based on passive syntax):

*dhabbō-se miṭ-aa nahī: gayaa
 stains-Instr wipe_{intr}-Pfv Neg PASS-Pfv

'The stains weren't able to (bring themselves to) erase themselves.'

A closely related diagnostic involves the formation of impersonal passives. Like in many other languages, impersonal passives in Hindi can be formed with unergative verbs but not with unaccusatives:⁴¹

i. a. Passive of an Unergative:

calo, daur̥-aa jaaye
 come run-Pfv PASS-Sbjv

'Come, let it be run i.e. let us run.'

b. *Passive of an Unaccusative:

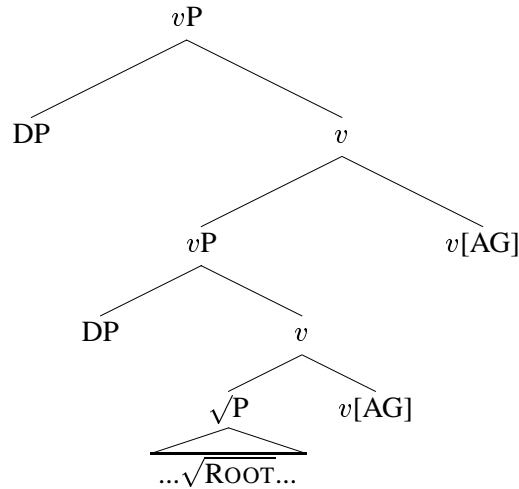
⁴¹Apparently Sanskrit apparently provides a counterexample to this pattern, forming impersonal passives from what appear to be unaccusatives (Ostler (19xx), Marantz (1984) for discussion).

*calo, kaṭ-aa jaaye
 come cut_{intr}-Pfv PASS-Pfv

These diagnostics clearly differentiate the two major classes of intransitive verbs. And according to these tests, all of the intransitives found in (63) behave as unergatives, and not as unaccusatives.

Having established that the intransitives in question are unergative, we can pose a further question about the examples found in (63) – in particular, whether these examples force a recursion on agentive *v*, with two projected Agents:⁴²

(68) Recursed *v*P with Agents



A preliminary answer to this question can be given based on the semantic assumptions made in §1.2.2. It was noted there that structures with immediate recursion on *v*[AG] yielded an illegitimate interpretation according to which a single event has two agents, and therefore are found only with causatives, not with transitives (see §5). Since transitives based on unergatives have a non-anomalous transitive interpretation, we can conclude that they do not have the structure indicated in (68).

Moreover, the interpretation of the transitives in (63) is not what one would expect if both arguments were licensed as Agents. While the verbs in (63) might appear superficially to have objects that are Agents of the action denoted by the verb, a closer examination reveals that in the transitive verbs in (63) the causee does not have to behave agentively, indicating that we are dealing with simple transitives rather than the structure in (68). One way of illustrating this point is with reference to different types of causees, as in (69). A transitive derivation is possible with an inanimate and non-agentive DP like *patang* ‘kite’, but not with *chiriyaa* ‘bird’:

(69) a. Unergative

patang/chiriyaa uṛ rahii hai
 kite.f/bird.f fly Prog.f be.Prs.Sg

⁴²The question seems to be parallel in certain ways to a question about causative derivations in English, raised by pairs of the following type (Levin and Rappaport (1995:111):

- (1) a. The soliders marched to the tents.
 b. The general marched the soldiers to the tents.

See below.

‘The kite/the bird is flying.’

b. Transitive

Anjali patang/*?chiriyaa uṛaa rahii hai
Anjali.f kite.f/bird.f fly Prog.f be.Prs.Sg

‘Anjali is flying a kite/*a bird.’

Similar observations hold for the other transitives based on unergatives. For example consider the transitive *nach-aa* based on the unergative *naach* ‘dance’.

(70) a. Unergative

Rohan naach rahaa hai
Rohan.m dance Prog.MSg be.Prs.3MSg

‘Rohan is dancing.’

b. Transitive

Shama Rohan-ko nach-aa rahii hai
Shama.f Rohan-Acc dance-AA Prog.f be.Prs.3MSg

‘Shama is making Rohan dance/twirling him around (the dance floor).’

The causee can be interpreted agentively, but as (70b) shows, it does not have to be. We take the non-obligatoriness of the agentive interpretation of the causee to show that the causee is not syntactically represented as an agent. This is in contrast to the subjects of (70a) (an unergative structure) and (70b) (a transitive structure).^{43,44}

Having argued that the transitives examined in this section are not transitives of unergatives, i.e. do not have the structure in (68), some questions remain concerning the structure and interpretation of these formations. Concerning the structure, it might seem that the simplest case, the structure of the transitive is just the structure of any other transitive; we illustrate here with $\sqrt{\text{UR}}$ ‘fly’:

(71) Transitive (see (69b) above)

⁴³See the discussion of causativization of unergatives in Papago (Tohono O’odham) in Hale and Keyser (1993b).

⁴⁴A further diagnostic, based on the reduced relative environment employed above, also suggests that the causee in a transitive based on an unergative does not have the same syntactic status as the corresponding external argument in the unergative. It was noted earlier that reduced relative could not be formed on unergatives. However, it is possible to form reduced relatives on the transitives based on unergatives.

(1) a. Intransitive from (63)

*dauṛ-aa laṛkaa
run-Pfv.MSg boy

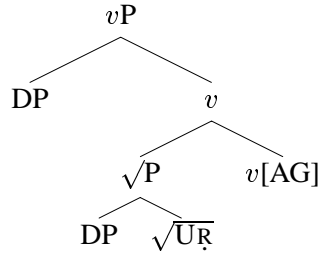
‘*the run boy’

b. Transitive from (63)

[Ravi-dwaaraa dauṛ-aa-yaa gayaa] laṛkaa
Ravi-by run-CAUS-Pfv PASS-Pfv boy

‘the boy chased by Ravi’

This could be taken to suggest that the object of *dauṛ-aa* ‘run-CAUS’ is structurally like the object of a transitive and not like the external argument of the unergative *dauṛ* ‘run’.



Concerning the interpretation of transitive examples like those we have considered above, a further question is how in examples like (71) the object of the verb can be interpreted as flying, similar to the case in the intransitive. In (71), the object DP must be interpreted as an object of the Root. This might account for the “pseudo-agentive” interpretation that the object in such clauses has. That is, the only way in which an argument of $\sqrt{\text{UR}}$ ‘fly’ can be interpreted is as something that is in flight. In this particular case, this is parallel to English ‘fly’, in pairs like *The plane flew* and *The pilot flew the plane*.

This solution appears, however, to lead to a serious problem. Recall that the Roots that function as unergatives in (63) cannot form participial modifiers unless they appear with *-aa*:

- (72) a. Unergative:
 *daur-aa (huua) lar̄kaa
 run-Pfv be-Pfv boy
 ‘*the run boy’
- b. Unaccusative:
 kaṭ-e (hue) phal
 cut_{intr}-Pfv.MPI be-Pfv.MPI fruit
 ‘the fruits in the cut-state, the fruits that are cut’
- c. [Ravi-dwaaraa daur-aa-yaa gayaa] lar̄kaa
 Ravi-by run-CAUS-Pfv PASS-Pfv boy
 ‘the boy chased by Ravi’

A plausible reason for the ungrammaticality of (26) appeals to the nature of unergative Roots like $\sqrt{\text{DAUR}}$. The participial environment in (72a) and (72b) is a kind of *Resultative* participle. In such participles, the sole DP that is present is interpreted as an argument of the Root. The ungrammaticality of (72a) would then follow from the fact that Roots that surface in unergative syntax like $\sqrt{\text{DAUR}}$ do not take an argument.⁴⁵

This solution to the ungrammaticality of (72a) seems to have substantial motivation. Yet it is apparently at odds with our provisional treatment of the transitives in (63), the analysis that treats these transitives as simple transitives like (71). That treatment requires the object DPs in transitives from (63) to be interpreted as arguments of the Root. This is clearly in conflict with the explanation for the ungrammaticality of (72a) that we have just reviewed, which relies crucially on the idea that the Roots that appear in (63) cannot take arguments.

INSERT SOLUTION HERE

Finally, there is an additional question concerning the generality with which Roots may appear in both the Unergative and the Transitive structures. This is stated as follows:

⁴⁵Cf. Hale and Keyser (1998), where the defining property of unergatives is that they are formed from ‘nominals’; these ‘nominals’ are for Hale and Keyser elements that take no arguments.

(73) QUESTION: Are all unergatives capable of being causativized in Hindi?

The answer, or more precisely the answers, to this question depend on some of the distinctions that we have been at pains to make above. If by ‘unergative’ we refer to the structural notion of an intransitive clause in which *v*[AG] appears, then the answer is no— there are no structures in which *v*[AG] takes an unergative complement; i.e., the structure in (68) is never generated.

If, on the other hand, ‘unergative’ is taken to mean ‘Roots that (typically) appear in unergative structures’, the answer is different. Not every Root that is found in unergative syntax is capable of appearing in the Transitive structure (71). For example, onomatopoeic denominatives in *-aa* such as *hinhinaa-naa* ‘neigh’, *bilbilaa-naa* ‘cry in pain’, *mimiyaa-naa* ‘bleat’ etc. appear with unergative syntax but not in transitive structures.⁴⁶

Here we need some examples, and we need to say something about this pattern— i.e. why all Roots that can be unergative are not the same

4.2 Ingesto-Reflexives

I think we are going to have to (gasp) use the term ‘Applicative’ somewhere here; very unscientific

A further class of verbs which show derivations involving an *-aa* causative are a coherent set referred to as *ingestives* or *ingesto-reflexives*, a name drawn from the traditional literature. These are verbs that (in the typical case) refer to some sort of ingestion, whether literal or not so literal.⁴⁷

(74) *-aa*- Causatives of Ingesto-Reflexive Verbs

Verb	Verb-aa	Gloss
chakh-naa	chakh-aa-naa	‘taste/cause to taste’
dekh-naa	dikh(l)-aa-naa	‘see/show’
khaa-naa	khil-aa-naa	‘eat/feed’
pakar-naa	pakr-aa-naa	‘hold, catch/hand, cause to hold’
parh-naa	parh-aa-naa	‘read/teach’
pehen-naa	pehn-aa-naa	‘wear/clothe’
pii-naa	pil-aa-naa	‘drink/cause to drink’
samajh-naa	samjh-aa-naa	‘understand/explain’
siikh-naa	sikh-aa-naa	‘learn/teach’
sun-naa	sun-aa-naa	‘hear/cause to hear, tell’

In each of the alternations in (74), a transitive verb with no overt affixes is paired with a ditransitive with *-aa*. The ditransitives in this case are direct causatives, as opposed to the *indirect causatives* formed with the affix *-vaa* (recall our introductory discussion of the data in §1.2). The fact that the ditransitives in (74) are direct causatives and not indirect causatives is clear from the fact that the ingestive verbs also have causatives in *-vaa*, and the *-aa* and *-vaa* forms are not synonymous:

(75) a. Ram-ne *Bill-se Sita-ko angrezi sikh-aa-yii
 Ram-ERG *Bill-INST Sita-DAT English learn-CAUS-PERF.FEM
 ‘Ram taught Sita English.’

⁴⁶NOTE: However, *khatkhataa-naa* ‘knock’ seems to allow both the ‘He is knocking’ and the ‘He is knocking the door’ usages. I am not sure what to make of this.

⁴⁷The class of ingestio-reflexive verbs seems to stay the same across many Indo-Aryan languages (cf. (Cardona (1965)) for Gujarati, (Hook and Koul (1984)) for Kashmiri, and Masica (1976) for a crosslinguistic overview).

- b. Ram-ne Bill-se Sita-ko angrezi sikh-vaa-yii
 Ram-ERG Bill-INST Sita-DAT English learn-CAUS2-PERF.FEM
 ‘Ram had Sita taught English by Bill.’

The differences between the *-aa* and *-vaa* causatives also manifests itself as a difference in case-marking. The intermediate agent in the *-aa-* causative is marked by *-ko*, while the intermediate agent in the *-vaa-* causative is marked by *-se* and is optional.

Our position is that the syntax of the ditransitive ingestive is the same as the syntax of double-object verbs like *give*. An initial argument in support of this claim is based on the behavior of the *-ko* marked phrases found in the examples above. The case-marker *-ko* appears on dative phrases as well as on specific direct objects of transitive verbs. Transitives, irrespective of whether they are basic or part of a transitivity alternation, allow for *-ko* to be dropped:

(76) Specificity *-ko* (Optional)

a. Basic Transitive:

Tina tasviir(-ko) dekh rahii hai
 Tina.f picture.f-Acc see Prog.f be.Prs

‘Tina is looking at a/the picture.’

b. Causative of AA-Class:

Tina haar(-ko) uṭh-aa rahii hai
 Tina.f necklace-Acc raise-CAUS Prog.f be.Prs

‘Tina is lifting a/the necklace.’

c. Causative of NULL-Class:

Tina kitaab(-ko) phaṛ rahii hai
 Tina.f book-Acc tear Prog.f be.Prs

‘Tina is tearing a/the book.’

d. Causative of an unergative:

Tina haathii(-ko) dauṛ-aa rahii hai
 Tina.f elephant.f-Acc run-Caus Prog.f be.Prs

‘Tina is chasing a/the elephant.’

True ditransitives like *give* do not show optionality with *-ko* marking:

(77) Basic Ditransitive:

Tina-ne Mina*(-ko) kitaab di-i
 Tina-Erg Mina-Dat book.f give-Pfv.f

‘Tina gave a book to Mina.’

In the Ingesto-Reflexives, the *-ko* on the intermediate agent is a true Dative marker, and cannot be omitted as can the *-ko* related to specificity.

(78) Causative of Ingesto-Reflexive:

Tina-ne Mina*(-ko) angrezii sikh-aa-yii
 Tina-Erg Mina-Dat English.f learn-CAUS-Pfv.f

'Tina taught Mona English.'

That is, unlike what we find with transitives, neither the *-aa* causatives of ingesto-reflexives nor ditransitives allow for the *-ko*-marking to be optional. This suggests that the two are the same structurally.

One potential confound here is that the *-ko* marked arguments in (78a,b) are animate and thus might require *-ko*-marking due to a Hindi-internal requirement that animate objects be obligatorily *-ko* marked.

- (79) Tina-ne Ron-ko/#Ron dekh-aa
Tina-Erg Ron-Acc/Ron see-Pfv
'Tina saw Ron.' (without *-ko*: 'Tina saw the object/the blob Ron')

However, employing passivization allows us to sidestep this potential problem. The *-ko*-marked objects related to specificity can be optionally promoted. This means that in cases of this type there will be passives in which the logical object of the verb bears no *-ko*, paired with cases in which *-ko* is present on that argument in the active:

- (80) a. Basic Transitive:
Tasviir/Sita bazaar-me dekh-ii gayii
picture.f/Sita.f market-in see-Pfv.f Pass-Pfv.f
'The picture/Sita was seen in the market.'
- b. Causative of -AA Class:
haar uṭh-aa-yaa gayaa
necklace.m raise-CAUS-Pfv.MSg Pass.Pfv.MSg
'The necklace was lifted.'
- c. Causative of NULL Class:
kitaab phaar-ii jaa rahii hai
book.f tear-Pfv.f Pass Prog.f be.Prs
'The book is being torn.'
- d. Causative of Unergative:
haathii daur-aa-yaa jaa rahaa hai
elephant.m run-CAUS-Pfv.MSg Pass Prog.MSg be.Prs
'The elephant is being chased.'

This possibility is unavailable to the *-ko*-marked arguments of ditransitives; once again, the causative of the Ingesto-reflexives patterns with true ditransitives:

- (81) Dative *-ko* (No Promotion)
- a. Basic Ditransitive:
Mina-ko/*Mina kitaab di-i gayii
Mina-Dat/Mina.f book.f give-Pfv.f Pass-Pfv.f
'The book was given to Mina.'

b. Causative of Ingesto-Reflexive:

Mina-ko/*Mina angrezii sikh-aa-yii gayii
Mina-Dat/Mina.f English.f learn-CAUS-Pfv.f Pass-Pfv.f

‘English was taught to Mina.’

This suggests that the dative argument of an ingestio-reflexive verb, which might seem like a kind of agent, has a status distinct from the agent of the causative of an unaccusative or unergative verb. In causatives of Ingestives, the argument corresponding to the Agent of the transitive verb is syntactically like the Dative argument in a double-object structure. In causatives of unaccusatives (§2) or unergatives (§3.1), the argument of either type of intransitive behaves like a transitive object in the causative.

Further arguments support the conclusion that the causativized ingestives have the internal syntax of prototypical ditransitives such as *de* ‘give’. Like ditransitives, they participate in a process of obligatory object shift (Bhatt and Anagnostopoulou (1996)):

(82) Object shift in prototypical ditransitives

a. basic word order:

Tina-ne Mina-ko vo kitaab di-i
Tina-Erg Mina-Dat that book.f give-Pfv.f

‘Tina gave that book to Mina.’

b. with object shift:

Tina-ne [us kitaab-ko]_i Mina-ko t_i di-yaa
Tina-Erg that book-Acc Mina-Dat give-Pfv

‘Tina gave that book to Mina.’

(83) Object shift in causatives of ingestio-reflexives

a. basic word order:

Ram-ne Sita-ko vo bhaashaa sikh-aa-yii
Ram-Erg Sita-Dat that language learn-CAUS-Pfv.f

‘Ram taught Sita that language.’

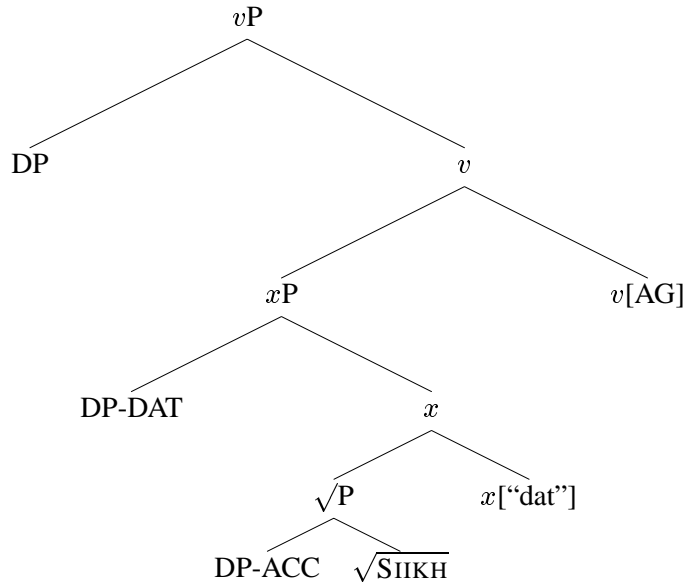
b. with object shift:

Ram-ne [us bhaasha-ko]_i Sita-ko t_i sikh-aa-yaa
Ram-Erg that.Obl language-Acc Sita-Dat learn-CAUS-Pfv

‘Ram taught Sita that language.’

We take the structure of the causative-ingestive to have the same shell structure as that associated with typical double-object verbs like ‘give’. This is illustrated in (84), where the lower DP arguments are shown with abstract case-markers -DAT and -ACC for exposition:

(84) Ditransitive

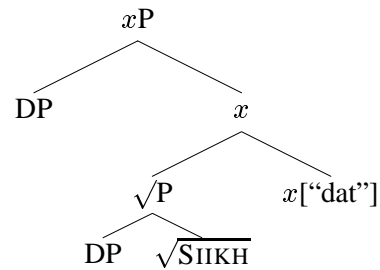
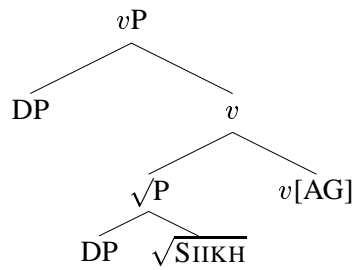


The *-aa* found in the ditransitives of ingestives to be the realization of the *v*[AG], a point which we will discuss in detail in §5.

Having clarified the structure of the ditransitive, some further questions remain concerning the status of the transitive members of these alternations. In particular, are these transitives identical to other transitives (i.e. to non-ingestives), as in Option 1, or are the transitives of ingestives already distinct from other transitives, as in Option 2? Illustrating with the Root $\sqrt{\text{SIIKH}}$ ‘learn’, the options are as follows:

(85) Option 1: Transitive

(86) Option 2: Transitive



Choosing between these two options reduces to a simple question— is there any reason to believe that the syntax of transitive Ingesto-Reflexives differs from that of other transitives?

One observation relevant to this question concerns the formation of unaccusative intransitives, which is very general among the classes of transitive verbs in Hindi. In the ingesto-reflexive class, there are as far as we know no Roots that are capable of appearing as unaccusative intransitives.⁴⁸

⁴⁸The verb *bhuul* ‘forget’ which one might expect to be in the class of ingestives patterns with other ingestives in lacking an intransitive counterpart. However, its *-aa*- causative displays unusual properties.

- (ii) a. Ram Sita-ko bhuul ga-yaa
 Ram Sita-Acc forget GO-Pfv
 ‘Ram forgot_{non-agentive} Sita.’
- b. Ram-ne Sita-ko bhul-aa di-yaa
 Ram-Erg Sita-Acc forget-CAUS? GIVE-Pfv
 ‘Ram forgot_{agentive} Sita.’ (‘Ram put Sita out of his mind.’)

Some, however, participate in alternations typical of psychological predicates (e.g. *dikh/dekh*).

- (87) a. Ram-ko Sita dikh-ii
 Ram-Dat Sita see-Pfv.f
 ‘Ram saw Sita (lit. Sita appeared to Ram).’
 b. Ram-ne Sita-ko dekh-aa
 Ram-Erg Sita-Acc see-Pfv
 ‘Ram saw Sita.’

5 The Indirect Causative

As we noted in our introductory remarks, the alternations examined in the last two sections involve what is often referred to as ‘transitivization’ or ‘lexical causativization’. We turn in this section to the analysis of what we have called the ‘Indirect’ causative. This type of causative shows the suffix *-vaa*, as seen in the following example:

- (88) zamiindaar-ne (ḍakaitō-se) makaan jal-**vaa** diyaa.
 landlord-Erg bandits-Instr house.M burn-CAUS GIVE-PERF.M
 ‘The landlord had the house burned (by the dacoits).’

We refer to it as the Indirect Causative because...

The intermediate agent of the Indirect Causative is marked by the instrumental case-marker *-se* which was discussed above. The same instrumental case-marker can also appear on the demoted agents of passives, as seen in (89):⁴⁹

- (89) **tum-se** itnaa khaanaa kaise khaayaa jaataa hai?
 you-Instr so-much food.M how eat-PERF.M PASS-HAB.M be.Prs
 ‘How is it that so much food is eaten by you?’ (i.e. How do you manage to eat so much food?)

In line with the discussion of §1, we take it that causatives of this type are formed with the addition of an agent-licensing head *v*[AG], and an external argument, the DP in the specifier of this head. A further question concerns the syntactic structure that this causativizing *v*[AG] takes as its complement. The hypothesis that we develop here is that the *vaa*-causative involves a *v*[AG] head taking what is essentially a passive complement.⁵⁰ Since there is no morphological or semantic

Unlike *-aa-* of ingestives whose valence is one greater than that of the corresponding transitive, *bhuul* and *bhul-aa* have the same valence. They only differ with respect to agentivity.

⁴⁹The demoted agent of a passive is more often marked by a *dwaaraa*, as we noted in §2. The choice between *se* and (*ke*) *dwaaraa* is subject to idiolectal variation as well as semantic considerations (cf. Pandharipande (1979)). Also Hook (1979) notes that in formal style, (*ke*) *dwaaraa* can be used to mark the intermediate agent of an indirect causative.

- (i) (from Hook (1979):209)

baba-ne **bhaktō-ke-dwaaraa** use apne-paas biṭh-vaa liyaa
 Baba-Erg devotees-BY s/he.Dat self-near sit-VAA TAKE-Pfv

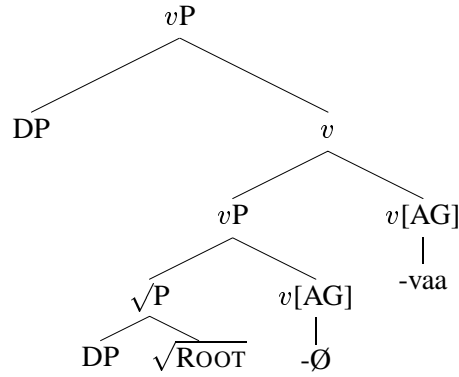
‘Baba had her seated near him by his devotees.’

For the rest of this discussion, we will set aside the question of the choice between *dwaaraa* and *se*.

⁵⁰This is parallel in certain respects to the analysis of the *faire-par* type causative in Romance (Burzio (1986)); see Guasti (1996) for a more recent discussion of the Romance causatives.

evidence for there being an Aspectual or Temporal projection in the complement of the highest $v[AG]$, we treat this head as taking a passive vP complement; by ‘passive’ here we mean a vP that contains $v[AG]$, but no Case feature and no DP in the specifier of this head (see e.g. Embick 1997):

(90) Indirect Causative



The above structure accounts directly for the fact that the intermediate agent is optional in the Indirect Causative, and the fact that this agent, when overt, has the same case-marker that is found with passive agents. We assume that the highest vP has a syntactic Case feature, which must be assigned to the lower DP object.

In treating the causative as taking a vP complement, we differ from syntactic accounts of causativization in which the causativizing verb takes a larger complement, such as a CP (as in Baker (1988) and related work) or a (defective or non-finite) TP. These differences relate primarily to assumptions about the number of events that are associated with a structure, which we turn to immediately below.

An additional question concerns the causativizing head that appears in the Causative; we have represented this as $v[AG]$, rather than as a specialized type of Causative head. The general point uniting these two questions concerns the semantics of indirect causation, and how this is derived in terms of structures and features. More specifically, the question is whether indirect causation results from the type of complement that the causative head takes, or from the feature content of the causative head (or both).

Given our initial discussion of the semantics of causative heads, one could conclude that structures like (9, repeated as 91) are simply not used by the grammar because they would always yield semantically anomalous structures.

(91) ... $[_{vP} XP [_{v'} v[AG] [_{vP} YP [_{v'} v[AG] [_{VP} \dots]]]]]$

However, we believe that the correct conclusion is more limited in scope. Structures like (91) are indeed anomalous if we try to interpret them using the usual rules of semantic composition together with event identification. But it is plausible that some languages have a syncategorematic rule that allows for other interpretations for structures like (9) that involve a $v[AG]$ taking a $v[AG]P$ complement. One interpretation that seems available in many languages is referred to as indirect causation.

(92) ... $[_{vP} \text{John} [_{v'} v[AG] [_{vP} \text{Bill} [_{v'} v[AG] [_{VP} \text{read Principia}]]]]]$

Interpretation:

$\lambda e_s [\text{Agent}(e) = \text{John} \wedge \exists e' [\text{read}(e', \text{Principia}) \wedge \text{Agent}(e) = \text{Bill} \wedge \text{Caus}(e, e')]]$

If the embedded *v*[AG]P lacks an external argument i.e. is passive, then we get a structure according to which the matrix subject is agent of the causing event but not the embedded event and the embedded event does not have an explicitly realized agent.

Our treatment of the I-causative makes a further prediction, given in (93):

(93) Passive Fails → No Indirect Causative Structure

That is, all other things being equal, verbs that do not allow for passivization should not form Indirect causatives, because the Indirect Causative is built directly on the passive structure. Some examples illustrating this pattern are as follows:

- (94) a. Rohit-ne [ghar jaa-naa] chaahaa
 Rohit-Erg home go-Ger want-PERF
 ‘Rohit wanted to go home.’
- b. *Passive
 *ghar jaa-naa chaah-aa gayaa
 home go-Ger want-PERF Pass-PERF
- c. *Indirect Causative
 *Rohit-ne (Nupur-se) [ghar jaa-naa] chah-vaa-yaa
 Rohit-Erg Nupir-Instr home go-Ger want-VAA-PERF

51

⁵¹Verbs may also fail to have *-vaa* causatives for other reasons. e.g. *khatkhatāa* ‘knock’ can be passivized but does not allow for a *-vaa* causative. The generalization that is relevant here is that denominal verbs formed by combining a nominal root with *-aa* lack *-vaa* causatives.

Unergatives can be passivized, as we discussed above:

- i. Passive of unergative:
- a. Ram-dwaaraa uṛ-aa jaa rahaa hai
 Ram-by fly-Pfv Pass Prog be.Prs
 ‘Ram is flying.’ (Lit. By Ram is being flown.)
- b. Passive of transitive:
- Ram-dwaaraa plane uṛaa-yaa jaa rahaa hai
 Ram-by plane fly-Pfv Pass Prog be.Prs
 ‘The plane is being flown by Ram.’

However, the *-vaa* causative seems to only be based on the transitive.

- ii. a. Indirect Causative on Transitive:
- Ram Mona-se plane uṛ-vaa rahaa hai
 Ram Mona-Instr plane fly-VAA Prog be.Prs.Sg
 ‘Ram is having the plane flown by Mona.’
- b. *Indirect Causative on Unergative:
- *Ram Mona-se uṛ-vaa rahaa hai
 Ram Mona-Instr fly-VAA Prog be.Prs.Sg
 ‘*Ram is having it be flown by Mona.’

This could result from a Case problem. In the Causative of the unergative, no argument is assigned the Case associated with the highest *v*[AG].

We haven't really discussed this class too much to this point, maybe we should figure out (1) where to first introduce them, and then (2) what to say about the differences they have with other verbs.

A further prediction that our analysis makes is that the stem-form of the verb that appears in the Indirect causative should be the same as that found in the transitive, since the passive, with *v*[AG], occurs on its own with the transitive stem form. This prediction is obscured in the majority of cases by the fact that the Indirect causative triggers the rule of Vowel Simplification, the same rule found in the transitives of AA-class of causatives and the intransitives of the NULL-class. Some examples are given in (95), where *aa*-forms are provided along with *-vaa* forms for comparison:⁵²

(95) Forms of *aa*- and *vaa*-Causatives

Intransitive	Transitive	-vaa Causative	Gloss
bāṭ-naa	bāāṭ-naa	bāṭ-vaa-naa	'divide'
badal-naa	badal-naa	badal-vaa-naa	'change'
bhaag-naa	bhag-aa-naa	bhag-vaa-naa	'run'
chap-naa	chaap-naa	chap-vaa-naa	'print'
suukh-naa	sukh-aa-naa	sukh-vaa-naa	'dry'
ubal-naa	ubaal-naa	ubal-vaa-naa	'boil'

In spite of these difficulties in testing the prediction, there are further cases in which it can be assessed. These cases involve Roots which show different stem-final consonants in their intransitive and transitive forms, as in (96):

(96) Final Consonant + Vowel Change

Intransitive	Transitive	Gloss
chhuṭ-naa	chhoṭ-naa	'be free/free'
phaṭ-naa	phaaṭ-naa	'be torn/tear'
phuṭ-naa	phoṭ-naa	'be burst/burst'
tuṭ-naa	toṭ-naa	'break'

The *-vaa*- causatives for these verbs are formed as in (97). The stem-final consonant in the *-vaa* causative is that found in the transitive form, not the intransitive:⁵³

(97) Consonant Changing Alternations

⁵²Note in these cases that the *-vaa* causative does not show a sequence *aa-vaa* for these AA-class verbs, even though it is formed from the transitive. The reason for this is morphological, as we discuss in §5.

⁵³There are two additional verbs which suggest that this generalization is not entirely correct, or at the very least that it may be overridden in certain cases:

(i) Further Irregular Morphophonology

Intransitive	Transitive	-vaa Causative	Gloss
bik-naa	bech-naa	bik-vaa-naa	'be sold/sell'
simaṭ-naa	sameṭ-naa	simaṭ-vaa-naa	'be collected/collect'

Each of these verbs exhibits further irregularities: a change in the stem-final consonant in the first case, and two alternating vowels in the second. For the first verb, the stem form found in *-vaa* causative is that found in the intransitive, rather than that found in the transitive (**bich-vaa-naa*). For some speakers, however, the form *bek-naa* is used for the transitive (R. Kumar p.c.), in which case there is no problem. There are also speakers who permit *bich-vaa-naa* (Saksena (1980)). The second case should surface as **sameṭ-vaa-naa*, but it does not.

Intransitive	Transitive	-vaa Causative	Gloss
chhuṭ-naa	chhor-naa	chhuṭ-vaa-naa	'free'
phaṭ-naa	phaar-naa	phaṭ-vaa-naa	'tear'
phuṭ-naa	phor-naa	phuṭ-vaa-naa	'burst'
tuṭ-naa	tor-naa	tuṭ-vaa-naa	'break'

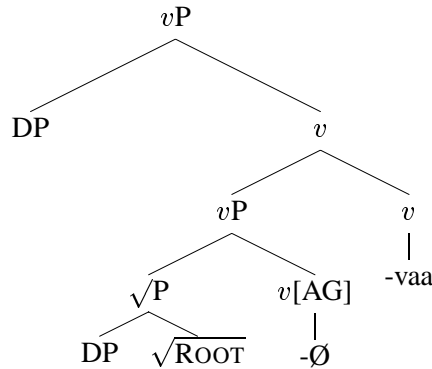
For the most part, then, the stem-form that is found in the Indirect causative confirms the hypothesis that this is formed on a passive substructure.

According to our proposal, *-vaa* causatives involve passive substructures based on the corresponding transitive. In the cases discussed above, there was only one derivative of any given Root that could be passivized, and therefore only one structure for the *-vaa*-causative. With the ingesto-reflexive class, there are two derivatives that can be passivized - the transitive form, and the ditransitive with *-aa*. Both can be passivized, so the prediction of our account is that a form suffixed with *-vaa* could be derived from either. This prediction is correct; we find that *-vaa* causatives of verbs from the Ingestive class are in fact ambiguous:

- (98) a. Transitive of ingesto-reflexive
 mĕ-ne kitaab paṛh-ii
 I-Erg book.f read-Pfv.f
 'I read the book.'
- b. Ditransitive of ingesto-reflexive
 mĕ-ne Raam-ko kitaab paṛh-aa-ii
 I-Erg Ram-Dat book.f read-CAUS-Pfv.f
 'I had Ram read the book.'
- (99) (ex. 33 from Saksena (1982))
- a. Indirect Causative targetting the Transitive ingesto-reflexive
 mĕ-ne Raam-se kitaab paṛh-vaa-ii
 I-Erg Ram-Instr book.f read-VAA-Pfv.f
 'I had the book read by Ram.'
- b. Indirect Causative targetting the ditransitive based on ingesto-reflexive
 mĕ-ne Nina-se Raam-ko kitaab paṛh-vaa-ii
 I-Erg Nina-Instr Ram-Dat book.f read-VAA-Pfv.f
 'I had Ram made to read the book by Nina.'

The arguments presented to this point have motivated the idea that the *-vaa* causative involves a causative head *v*[AG] taking a passive complement; that is, a complement with *v*[AG], but with no projected external argument. Based on what we have discussed to this point, this could simply involve a *v*[AG] taking a *v*P complement, as in (100), where the exponents that appear in the *v* positions are shown for expository purposes:

- (100) Indirect Causative



6 Allomorphy of Causative Heads

To this point we have concentrated on the structures that are found in different types of causative derivations in Hindi. Throughout our analysis, we have made reference to various types of verbalizing or causativizing functional heads, i.e., heads of the *v* type. In this section we turn to a number of questions concerning the phonological forms taken by such heads. We will begin by reviewing some of the basic generalizations concerning how the *v* heads are realized. Recall that, at the very least, we will be accounting for the distribution of an *-aa* exponent for the AA-class, a *-∅* exponent for the NULL-class, and what we have referred to as the *-vaa* exponent in Indirect Causatives. A further fact concerns the realization of *v* heads in various intransitives, which are assumed to contain some type of *v* head (recall §2.) This head in intransitives is always null. Coupled with the fact that there is a *-∅* realization of *v[AG]* as well (in the NULL-class), it appears that the default realization of *v* in general in Hindi is *-∅*, subject to some further complications that we address below.

A further point concerns the nature and distribution of *-vaa*, which is found exclusively in Indirect Causatives. So whenever *-vaa* appears, we have an Indirect Causative. This is a one-way implication, as we will demonstrate below; there are some Indirect Causatives in which we find *-aa* instead; we will comment on these below. We demonstrate below that *-vaa* is actually internally complex, and is analyzed as a component *-v* along with the *-aa* that is found in e.g. the AA-class of alternating verbs:

6.1 Realization of *v* Heads in Hindi

In addition to the overt allomorphs mentioned above, *v* heads in Hindi also have a *-∅* allomorph. This appears in the following environments:

- (101) Distribution of *-∅* for *v*
- a. As the realization of *v[AG]* in the transitives of the NULL-class of verbs
 - b. As the realization of the ‘applicative’ *v* in Ingestives
 - c. As the realization of *v* heads in intransitives

We take it that this distribution results from *-∅* being the default realization of *v* heads of all types in Hindi. This is expressed by the Vocabulary Item in (102):

- (102) $v \leftrightarrow -\emptyset$

The distribution of the *-aa* exponent is, at first glance, complex as well, as *-aa* actually seems to be inserted in a number of environments. However, these environments form a natural class. To begin with, *-aa* appears in the following two environments:

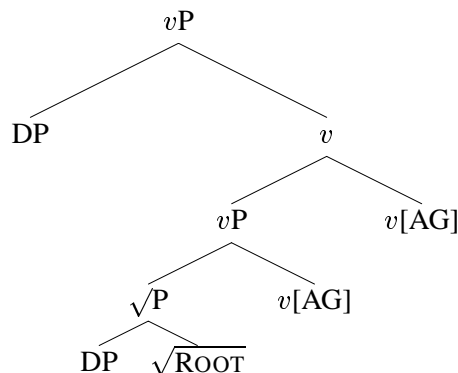
- (103) a. As the realization of the $v[AG]$ with a certain class of Roots (i.e. the AA-class)
 b. As the realization of a $v[AG]$ taking a $v[APPL]$ complement in the ditransitives of the Ingestive class

A further fact about the form of Indirect Causatives points to a third environment in which *-aa* appears. Recall the basic characterization of the AA-class of alternating verbs. In the transitive, verbs of this class show the suffix *-aa*, as in (104). As we showed in the last section, the Indirect Causative is derived when a $v[AG]$ head takes a passive structure as its complement. This means that for verbs in the AA-class, the Indirect Causative should be formed on a structure in which *-aa* is realized. However, this predicts that one should find the verb affixed with *-aa-vaa* (assuming a simplex *-vaa*), in the Indirect Causative, as in the ungrammatical (104c). The actual form of the Indirect Causative has only the *-vaa*:

- (104) a. Ramesh bach ga-yaa
 Ramesh save GO-Pfv
 ‘Ramesh got saved.’
 b. Ram-ne Ramesh-ko bach-aa-yaa
 Ram-Erg Ramesh-Acc save-AA-Pfv
 ‘Ram saved Ramesh.’
 c. *Ram-ne Mahesh-se Ramesh-ko bach-aa-vaa-yaa
 Ram-Erg Mahesh-by Ramesh-Acc save-AA-VAA-Pfv
 d. Ram-ne Mahesh-se Ramesh-ko bach-vaa-yaa
 Ram-Erg Mahesh-by Ramesh-Acc save-VAA-Pfv
 ‘Ram had Ramesh saved by Mahesh.’

Reviewing what we have said about the structures, the syntactico-semantic evidence we have provided shows that the structure in (105) is found in the Indirect Causative:

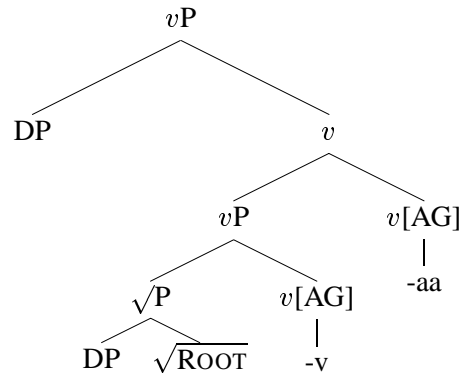
(105) Indirect Causative



All other things being equal, the lower v head in this structure is expected to be realized as *-aa* in the AA-class; but in the Indirect Causative, but it is not.

We propose to treat this effect by analyzing the *-vaa* found in the Indirect Causative as internally complex: it consists of a *-v-* exponent, which realizes the lower $v[AG]$ in (105), and an *-aa* exponent, which realizes the higher $v[AG]$:

(106) Indirect Causative



The idea is that *-v-* occurs under special circumstances, i.e. as the realization of a *v[AG]* head that is dominated by another *v[AG]* head:

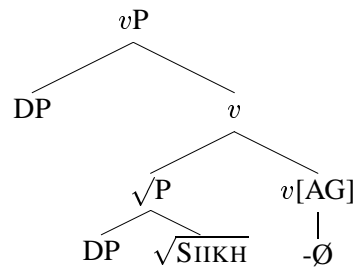
(107) $v[AG] \leftrightarrow -v-/_ \text{ dominated by } v[AG]$

This rule inserts *-v-* in the lower *v[AG]* of Indirect Causatives for all verbs; in this way, it blocks the insertion both of $-\emptyset$ in the NULL-class verbs, and of *-aa* in the AA-class verbs.

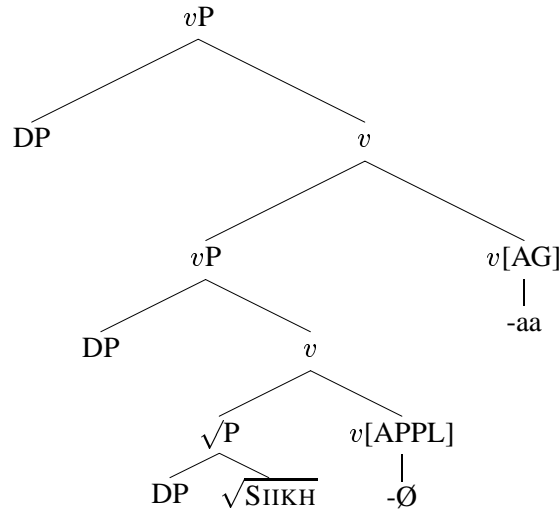
- (108)
- a. As the realization of the *v[AG]* with a certain class of Roots (i.e. the AA-class)
 - b. As the realization of a *v[AG]* taking a *v[APPL]* complement in the ditransitives of the Ingestive class
 - c. Assuming the decomposition of *-vaa* into *-v* and *-aa* sketched above, as the realization of the highest *v[AG]* found in the Indirect Causative

Above we noted that $-\emptyset$ functions as a default for *v* heads of all types. While this treatment of $-\emptyset$ is clearly on the right track, there is also a sense in which *-aa* serves as a kind of default. In all Indirect Causatives, the highest *v[AG]* is realized as *-aa*. Similarly, in the ditransitives of Ingestives, the highest *v[AG]* is always realized as *-aa* as well. This second point is significant, because when they are transitive, the Ingestives take the $-\emptyset$ allomorph of *v[AG]*. This is illustrated in the following trees for transitive and ditransitive $\sqrt{\text{SIKH}}$ ('learn'/'teach'):

(109) Transitive Ingestive



(110) Ditransitive Ingestive



Putting together the facts about *-aa* in Indirect Causatives and Ingestives, the generalization is as follows:⁵⁴

- (111) **Distribution of *-aa*:** A *v[AG]* head is always realized as *-aa* when that *v[AG]* head dominates another *v* head.

It is also the case that a *v[AG]* is realized as *-aa* on a Root-specific basis as well, in the case of the AA-class verbs. Revising our generalizations about *-aa* in (108), our generalizations about *-aa* are given in (112):

- (112) Distribution of *-aa* (Revised)
- The realization of a Root-attached *v[AG]* for a listed class of verbs
 - The only realization of *v[AG]* when *v[AG]* dominates other *v* heads (whether *v[AG]* or *v[APPL]*)

NOTE: Argument against treatment of alternating transitives as involving *v[B]* and *v[AG]*, unless this is only the -AA class...

The behavior summarized in (112) suggests that *-aa* appears as the spell out of *v[AG]* with a specific set of Roots when that head is Root-attached, and as the realization of *v[AG]* in general when that head is attached outside of other functional heads. This pattern converges with observations about allomorphy that have been developed in terms of the structural approach to word formation assumed here, in which a significant distinction is made between functional heads that are attached to Roots, and functional heads that are attached to other functional heads, in what we will call the *Outer Cycle* (see Marantz (2001), Embick (2003)).

Illustrate!?!?

In the implementation of Embick (2003), the same functional head may have distinct contextual conditions on insertion depending upon whether that head is attached to a Root or attached outside of the Root.

What the distinction between Root-attached versus Outer Cycle provides in the present case is a way of stating the generalizations we established above. We can analyze *-∅* as the default

⁵⁴The only putative counterexample to this claim is the verb *give*, which shows no *-aa* affix. We take this to result from the fact that *give* simply is a realization of a bundle of features, i.e. it is a light-verb. This verb is also puzzling from the perspective of the optionality of *-aa* and *-v-aa* in the Indirect Causative; see below.

realization of *v*, but restrict this to the Root-Attached domain. Moving past the $-\emptyset$, in the Root-Attached domain, *-aa* realizes *v*[AG], but only with a listed set of verbs, i.e. the AA-class. In the Outer Cycle, however, the situation is different. All *v*[AG] heads in the Outer Cycle are realized as *-aa*. The fact that *-aa* is completely general in the Outer Cycle indicates that Lists are irrelevant; it is simply the only realization of *v*[AG] in the Outer Cycle. The following Vocabulary Items, divided by cycle, express this analysis:⁵⁵

(113) Vocabulary Items

Root-Attached	Outer Cycle
<i>v</i> [AG] ↔ - <i>v</i> /__dominated by <i>v</i>	<i>v</i> [AG] ↔ - <i>aa</i>
<i>v</i> [AG] ↔ - <i>aa</i> /LIST__	
<i>v</i> ↔ \emptyset	

Where LIST = AA-class verbs

It should be noted that while a Vocabulary Item with the exponent *-aa* appears in each cycle, there is, in a specific sense, only ‘one’ *-aa*; see Embick (2003) for discussion.

6.2 Optionality in Causatives between *-aa* and *-v-aa*

Above we noted that for the vast majority of verbs in Hindi, the Indirect Causative appears with *-v-aa*. It seems that the situation is slightly more complicated than this. There is in addition a further set of verbs for which the *-aa* causative has the interpretation typically found with *-vaa*, as we mentioned above in the overview of *-vaa*’s distribution. This is a class of verbs in which the *-aa* and *-vaa* affixed forms apparently have the same interpretation:

- (114) Ram-ne Bill-se kaam kar-aa/vaa-yaa
 Ram-ERG Bill-INST work do-CAUS2/CAUS2-PERF
 ‘Ram had the work done by Bill.’

All of the verbs that show this behavior are verbs that show $-\emptyset$ in the transitive form; that is to say, no verbs in the AA-class of alternating verbs discussed in §2 show this behavior. However, the verbs that have synonymous *-aa* and *-vaa* causatives are a listed subset of the verbs that have $-\emptyset$ in the transitive. The verbs that we have found to behave in this way are as follows:⁵⁶

(115) *-aa/-vaa* Apparently Synonymous

⁵⁵We assume that the structural condition ‘/__dominated by *v*’ takes precedence over the contextual condition associated with the list of AA-class verbs. Thus in the case of AA-class verbs, the VI inserting *v* will block the operation of the VI inserting *-aa* in the lower *v*[AG] in an Indirect Causative.

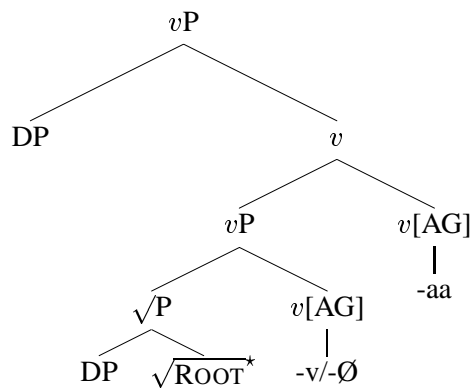
⁵⁶Diachronically speaking, there does not seem to be any sense in which these verbs form a natural class; we thank George Cardona for discussion of this point.

(Di)transitive	Indirect Causative	Gloss
chhu-naa	?chhu-aa/vaa-naa	‘touch’
de-naa	dil-aa/vaa-naa	‘give’
dho-naa	dhul-aa/vaa-naa	‘wash’
gin-naa	gin-aa/vaa-naa	‘count’
kaat-naa	kaṭ-aa/vaa-naa	‘cut’
kah-naa	kahl-aa/kahal-vaa-naa	‘say’
kar-naa	kar-aa/vaa-naa	‘do’
khel-naa	khil-?aa/vaa-naa	‘play’
likh-naa	likh-aa/vaa-naa	‘write’
rakh-naa	rakh-aa/vaa-naa	‘put’
sil-naa	sil-aa/vaa-naa	‘stitch’
tuṛ-naa	tuṛ-aa/vaa-naa	‘break’

The apparent optionality between *-aa* and *-vaa* with the set of verbs in (115) has some intriguing properties. Superficially it looks as if these might simply be *doublets*, such as the alternate spell-outs of the ASP head in English *prov-en* versus *prov-ed*, or for Tense in *div-ed* versus *dove-Ø*. However, when we look at the cases in greater detail, the Hindi facts are not exactly parallel to what is found in English. In each of the English cases the options involved are independently occurring exponents for members of the same type, where they are the only acceptable option. For instance, the *-en* is found with other participles (like *brok-en*), *-ed* is the default for participles, and so on. In the Hindi case, on the other hand, there are no verbs that can only take the *-aa* exponent in the Indirect Causative.

Whatever the nature of this optionality, we wish to treat it as optionality between *-v* and *-Ø* in the lower *v*[AG] of the causative structure. Using the notation $\sqrt{\text{ROOT}^*}$ for the Roots that allow this optionality, the situation is as follows:

(116) Indirect Causative



The optionality then has to do with the allomorph of *v* that is inserted, with the ‘special’ Roots in a local relationship with the head that shows the optionality.⁵⁷

6.3 Realization of *v* in Kashmiri

While we have concentrated throughout this paper on the analysis of causative derivations in Hindi, some comparative evidence helps to clarify the points we have established above. An interesting

⁵⁷With the exception, perhaps, of ‘give’.

point of contrast is provided by the patterns of realization of causative heads in Kashmiri. In Kashmiri, unlike Hindi, it is possible to have more than one instance of the causative exponent *-Ina:v* suffixed to a verb. Some examples of how various types are interpreted with one or two instances of this exponent are provided in (117):

(117) Kashmiri Causatives (from Hook and Koul (1984))

Type	base	base-CAUS	base-CAUS-CAUS	Gloss
Unaccusative	grak	grak-Ina:v	grak-Ina:v-Ina:v	'boil _{intr} '-'boil _{tr} '-'cause to boil'
Unergative	pak	pak-Ina:v	pak-Ina:v-Ina:v	'walk'-'drive'-'cause to drive'
Ingestive	par	par-Ina:v	par-Ina:v-Ina:v	'study'-'teach'-'cause to teach'
Transitive	kar	kar-Ina:v	kar-Ina:v-Ina:v	'do'-'cause to do'-'cause to do'

Completing the picture, Kashmiri also has a NULL-class of alternating verbs. With this class, the form suffixed with *-Ina:v* is an Indirect Causative, as expected given that the transitive has a \emptyset causative head:

(118) mar 'die'
 ma:r 'kill'
 ma:r-Ina:v 'cause to be killed'

Notice that with this class the form found in the Indirect Causative is the same phonological form found in the Transitive. This is because Kashmiri *-Ina:v* does not trigger *Vowel Simplification*, as the Hindi causative exponents do. The presence of the Transitive form in the Indirect Causative is, moreover, predicted by our syntactic analysis, as discussed in the previous section.

Returning to the patterns in (117), there are very clear reasons for thinking that the syntactico-semantic structures found in these derivations in Kashmiri are the same as in Hindi. This of course suggests that the presence of a *-v* rather than the expected *-aa* in Hindi Indirect Causatives is a morphological fact, and not a syntactico-semantic fact. That is, Hindi requires a Vocabulary Item that spells out *v[AG]* as *-v* when *v[AG]* is dominated by another *v*. This is a contextual allomorphy condition, which results in a Vocabulary Item inserting *-v* that blocks the insertion of *-aa*. In Kashmiri, on the other hand, the *v[AG]* that is realized as *-Ina:v* in the transitives is still realized as *-Ina:v* in the Indirect Causative structure. As the realization of the highest *v[AG]* in the Indirect Causative is also *-Ina:v*, we find two instances of this exponent, one for each of the *v[AG]* heads in the Indirect Causative. This can be stated directly if Kashmiri simply lacks a Vocabulary Item parallel to that which inserts *-v* in Hindi. As a result of this, in Kashmiri the lower *v[AG]* head in an Indirect Causative is realized as it would be in a simple transitive, i.e. as *-Ina:v* for verbs that are not in the NULL-class. The spell out of the relevant heads in Kashmiri is effected with the following Vocabulary Items:⁵⁸

(119) Vocabulary Items (Kashmiri)

Root-Attached	Outer Cycle
$v[AG] \leftrightarrow -Ina:v/LIST_ _$	$v[AG] \leftrightarrow -Ina:v$
$v \leftrightarrow \emptyset$	

Where LIST = INA:V-class verbs

⁵⁸Note also that *kar-Ina:v* 'do-CAUS' and *kar-Ina:v-Ina:v* 'do-CAUS-CAUS' seem to have the same meaning involving indirect causation. This is parallel to the apparent synonymy between *-aa* and *-vaa* causatives of certain verb in Hindi e.g. *kar-aa* 'cause to do' and *kar-vaa* 'cause to do' (cf. 115).

To conclude, then, Kashmiri provides explicit morphological evidence for the structure that we have provided for the Indirect Causative, in the form of two *-Ina:v* exponents found with the Indirect Causatives in (117).

7 Appendix: Verbs in the Transitivity Alternations

(120) NULL-Class

Intransitive	Transitive	Gloss
bāt-naa	bāāt-naa	'be divided/divide'
bandh-naa	baandh-naa	'connect'
bigar-naa	bigaar-naa	'spoil'
bikhar-naa	bikher-naa (bikhr-aa-naa)	'scatter'
chhap-naa	chhaap-naa	'be printed/print'
chhid-naa	chhed-naa	'be pierced/pierce'
chhil-naa	chhiil-naa	'be peeled/peel'
chhin-naa	chhīn-naa	'be sntached/snatch'
ḍhal-naa	ḍhaal-naa	'shape/sculpt'
dhul-naa	dho-naa	'be washed/wash'
gir-naa	ger-naa (gir-aa-naa)	'fall/cause to fall'
ghir-naa	gher-naa	'be surrounded/surrounded'
ghul-naa	ghol-naa	'dissolve'
jur-naa	joṛ-naa	'be added/add'
kaṭ-naa	kaat-naa	'be cut/cut'
khīch-naa	khīch-naa	'be pulled/pull'
khud-naa	khod-naa	'be dug/dug'
khul-naa	khol-naa	'open'
kuṭ-naa	kuuṭ-naa	'be ground/grind'
lad-naa	laad-naa	'be loaded/load'
luṭ-naa	luuṭ-naa	'be robbed/rob'
māj-naa	māāj-naa	'be scored/scour'
mar-naa	maar-naa	'die/kill'
muṛ-naa	moṛ-naa	'turn'
nichuṛ-naa	nichoṛ-naa	'be squeezed/squeeze'
nikal-naa	nikaal-naa	'come out/bring out'
pal-naa	paal-naa	'be brought up/bring up'
pighal-naa	pighaal-naa (pighl-aa-naa)	'melt'
pis-naa	piis-naa	'be pulverized/pulverize'
piṭ-naa	piit-naa	'be hit/hit'
ruk-naa	rok-naa	'stop'
sīch-naa	sīch-naa	'be irrigated/irrigate'
sīk-naa	sēk-naa	'be heated/heat'
sil-naa	sii-naa (sil-naa)	'be sewn/sew'
sudhar-naa	sudhaar-naa	'improve'
tan-naa	taan-naa	'be taught/tighten'
tul-naa	tol-naa	'be weighed/weigh'
ṭal-naa	ṭaal-naa	'be delayed/delay'
ṭaN-naa	ṭaaN-naa	'hang'
ubal-naa	ubaal-naa	'boil'
ukhar-naa	ukhaar-naa	'uproot'
ujar-naa	ujaar-naa	'destroy'
utar-naa	utaar-naa	'get down/bring down'

(121) AA-Class

Intransitive	Transitive	Gloss
bach-naa	bach-aa-naa	'be saved/save'
bah-naa	bah-aa-naa	'flow/cause to flow'
bahal-naa	bahl-aa-naa	'be entertained/entertain'
baith-naa	bith-aa-naa	'sit/seat'
barh-naa	barh-aa-naa	'increase/cause to increase'
bhaag-naa	bhag-aa-naa	'run away/cause to run away'
bhiig-naa	bhig-aa-naa (bhig-o-naa)	'become wet/wet'
bichh-naa	bichh-aa-naa	'unroll'
biit-na	bit-aa-naa	'elapse/cause to elapse'
bikhar-naa	bikhr-aa-naa (bikher-naa)	'scatter'
bujh-naa	bujh-aa-naa	'go/put out'
chamak-naa	chamk-aa-naa	'shine'
charh-naa	charh-aa-naa	'climb/cause to climb'
chipak-naa	chipk-aa-naa	'stick'
chOk-naa	chOk-aa-naa	'be startled/startle'
chuk-naa	chuk-aa-naa	'be paid/pay'
chhip-naa	chhip-aa-naa	'hide'
dar-naa	dar-aa-naa	'fear/scare'
duub-naa	duub-aa-naa (duub-o-naa)	'drown'
gal-naa	gal-aa-naa	'melt'
ghaṭ-naa	ghaṭ-aa-naa	'diminish/cause to diminish (subtract)'
gir-naa	gir-aa-naa (ger-naa)	'fall/cause to fall'
hil-naa	hil-aa-naa	'rock'
jaag-naa (jag-naa)	jag-aa-naa	'wake up'
jal-naa	jal-aa-naa	'burn'
jam-naa	jam-aa-naa	'freeze'
jii-naa	jil-aa-naa	'be alive/cause to be alive'
khil-naa	khil-aa-naa	'bloom/cause to bloom'
lag-naa	lag-aa-naa	'be planted, attach/plant?'
leṭ-naa	liṭ-aa-naa	'lie/cause to lie, lay'
mil-naa	mil-aa-naa	'meet/introduce'
miṭ-naa	miṭ-aa-naa	'be wiped/wipe'
pahūch-naa	pahūch-aa-naa	'arrive/escort'
pak-naa	pak-aa-naa	'ripen/cause to ripen, cook'
phail-naa	phail-aa-naa	'spread'
pighal-naa	pighl-aa-naa (pighaal-naa)	'melt'
ro-naa	rul-aa-naa	'cry/cause to cry'
saj-naa	saj-aa-naa	'be decorated/decorate'
sar-naa	sar-aa-naa	'rot'
so-naa	sul-aa-naa	'sleep/put to bed'
sulag-naa	sulg-aa-naa	'be lit, smoulder/light'
sulajh-naa	suljh-aa-naa	'get simplified/simplify'
suukh-naa	sukh-aa-naa	'dry'
ṭahal-naa	ṭahl-aa-naa	'stroll/cause to stroll'
ṭahar-naa	ṭahr-aa-naa	'stay/cause to stay'
ulajh-naa	uljh-aa-naa	'get complicated/complicate'
uṭh-naa	uṭh-aa-naa	'rise/raise'

Verbs that look (based on semantics) to be unergative intransitives: *run away, cry, stroll*.
Also psych-verbs, verbs of emission(?) (CHECK)

References

References

- Alexiadou, A., and E. Anagnostopoulou (2001) "Voice Morphology in the Causative-Inchoative Alternation: Evidence for a non-unified structural analysis of unaccusatives," in *The Unaccusativity Puzzle*, Oxford University Press.
- Baker, M. (1988) *Incorporation: A Theory of Grammatical Function Changing*, University of Chicago Press, Chicago.
- Bhatt, R., and E. Anagnostopoulou (1996) "Object Shift and Specificity: Evidence from *ko*-phrases in Hindi," in L. M. Dobrin, K. Singer, and L. McNair, eds., *Papers from the 32nd Regional Meeting of the Chicago Linguistics Society*, Chicago Linguistics Society, Chicago, 11–22.
- Bhatt, R., and R. Pancheva (2002) "Implicit Arguments," ms., University of Texas, Austin and USC.
- Borer, H. (1991) "The Causative-Inchoative Alternation: A Case Study in Parallel Morphology," *The Linguistic Review* 8, 119–58.
- Borer, H. (1994) "The Projection of Arguments," in E. Benedicto and J. Runner, eds., *University of Massachusetts Occasional Papers in Linguistics*, volume 17.
- Borer, H. (2001) "Exo-skeletal vs. Endo-skeletal Explanations: Syntactic Projection and the Lexicon," ms., USC.
- Borer, H. (2003) "The Exo-skeletal Trilogy," ms., USC.
- Burzio, L. (1986) *Italian syntax : a government-binding approach*, Studies in natural language and linguistic theory, Kluwer, Dordrecht.
- Cardona, G. (1965) *A Gujarati Reference Grammar*, The University of Pennsylvania Press, Philadelphia.
- Carstairs-McCarthy, A. (1994) "Inflection classes, gender, and the principle of contrast," *Language* 70:737-88.
- Chomsky, N. (1970) "Remarks on Nominalization," in R. A. Jacobs and P. S. Rosenbaum, eds., *Readings in English Transformational Grammar*, Ginn and Co., Waltham.
- Chomsky, N. (1981) *Lectures on Government and Binding*, Foris, Dordrecht.
- Davis, H. (2000) "Salish Evidence on the Causative-Inchoative Alternation," in W. Dressler, O. Pfeiffer, M. Pöchtrager, and J. Rennison, eds., *Morphological Analysis in Comparison*, John Benjamins, Amsterdam, Philadelphia, 25–60.
- Embick, D. (1996) "Causativization in Hupa," in J. Johnson, J. Juge, and J. Moxley, eds., *Proceedings of the Berkeley Linguistics Society* 22, 83–94.
- Embick, D. (1997) *Voice and the Interfaces of Syntax*, Doctoral dissertation, University of Pennsylvania.
- Embick, D. (2003) "Locality, Listedness, and Morphological Identity," ms., University of Pennsylvania.
- Embick, D. (to appear) "On the Structure of Resultative Participles in English," to appear in *Linguistic Inquiry*.
- Embick, D., and M. Halle (forthcoming) *Word Formation: Aspects of the Latin Conjugation in Distributed Morphology*, Mouton de Gruyter.
- Guasti, M. (1996) "Semantic Restrictions in Romance Causatives and the Incorporation Approach," *Linguistic Inquiry* 27:2, 294–312.

- Hale, K., and S. Keyser (1993a) "Argument Structure," in K. Hale and S. J. Keyser, eds., *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, MIT Press, Cambridge, MA.
- Hale, K., and S. Keyser (1998) "The Basic Elements of Argument Structure," in *Papers from the UPenn/MIT Roundtable on Argument Structure and Aspect*, MITWPL.
- Hale, K., and S. J. Keyser (1993b) "Argument Structure," in K. Hale and S. Keyser, eds., *The view from Building 20: essays in linguistics in honor of Sylvain Bromberger*, Studies in Linguistics 24, MIT Press, Cambridge, MA.
- Hale, K., and P. Platero (1996) "Navajo Reflections of a General Theory of Lexical Argument Structure," in E. Jelinek, S. Midgette, K. Rice, and L. Saxon, eds., *Athabaskan Language Studies: Essays in Honor of Robert W. Young*, University of New Mexico Press, Albuquerque.
- Halle, M., and A. Marantz (1993) "Distributed Morphology and the Pieces of Inflection," in K. Hale and S. Keyser, eds., *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, MIT Press, Cambridge, MA, 111–176.
- Harley, H. (1995) *Subjects, Events, and Licensing*, Doctoral dissertation, MIT.
- Haspelmath, M. (1993) "More on the Typology of Inchoative/Causative Verb Alternations," in B. Comrie and M. Polinsky, eds., *Causatives and Transitivity*, Benjamins, Amsterdam.
- Hook, P. E. (1979) *Hindi Structures: Intermediate Level*, Michigan Papers on South and South-East Asia 16, Center for South and South-East Asian Studies, University of Michigan, Ann Arbor, Michigan.
- Hook, P. E., and O. N. Koul (1984) "On the Grammar of Derived Transitives and Causatives in Kashmiri," in O. N. Koul and P. E. Hook, eds., *Aspects of Kashmiri Linguistics*, Series in Indian Languages and Linguistics 12, Bahri Publications, New Delhi, 90–122.
- Jelinek, E. (1998) "Voice and Transitivity as Functional Projections in Yaqui," in M. Butt and W. Geuder, eds., *Projections from the Lexicon*, CSLI, Stanford.
- Kratzer, A. (1994) "The Event Argument and the Semantics of Voice," ms., UMass Amherst.
- Kratzer, A. (1996) "Severing the External Argument from Its Verb," in J. Rooryck and L. Zaring, eds., *Phrase Structure and the Lexicon*, Kluwer.
- Lasnik, H. (1988) "Subjects and the Theta-Criterion," *Natural Language and Linguistic Theory* 6:1, 1–18.
- Levin, B., and M. Rappaport-Hovav (1995) *Unaccusativity: At the Syntax/Lexical Semantics Interface*, MIT Press, Cambridge, MA.
- Mahajan, A. K. (1995) "Active Passives," in R. Aranovich, W. Byrne, S. Preuss, and M. Senturia, eds., *Proceedings of the 13th West Coast Conference on Formal Linguistics*, Palo Alto, CA, CSLI, 286–301.
- Marantz, A. (1984) *On the Nature of Grammatical Relations*, MIT Press, Cambridge, MA.
- Marantz, A. (1997) "No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon," in A. Dimitriadis, L. Siegel, C. Surek-Clark, and A. Williams, eds., *Proceedings of the 21st Penn Linguistics Colloquium*, UPenn Working Papers in Linguistics, Philadelphia, 201–225.
- Marantz, A. (2001) "Words and Things," handout, MIT.
- Masica, C. (1976) *Defining a Linguistic Area: South Asia*, The University of Chicago Press, Chicago.

- Miyagawa, S. (1998) "(S)ase as an elsewhere causative and the syntactic nature of words," *Journal of Japanese Linguistics* 16, 67–110.
- Noyer, R. (1997) *Features, Positions and Affixes in Autonomous Morphological Structure*, Garland, New York.
- Noyer, R. (1998) "Impoverishment Theory and Morphosyntactic Markedness," in S. Lapointe, D. Brentari, and P. Farrell, eds., *Morphology and Its Relation to Syntax and Phonology*, CSLI, Stanford.
- Pandharipande, R. (1979) "Postpositions in Passive Sentences in Hindi," *Studies in the Linguistic Sciences* 9:2, 171–188.
- Pesetsky, D. (1995) *Zero Syntax*, MIT Press, Cambridge, MA.
- Pykkänen, M. (2002) *Introducing Arguments*, Doctoral dissertation, Massachusetts Institute of Technology.
- Saksena, A. (1980) "Causative Relations in Hindi," *General Linguistics* 20:1, 23–38.
- Saksena, A. (1982) "Contact in Causation," *Language* 58:4, 820–831.
- Smith, C. S. (1970) "Jespersen's 'Move and Change' Class and Causative Verbs in English," in M. A. Jazayery, E. Polomé, and W. Winter, eds., *Linguistic and Literary Studies in Honor of Archibald A. Hill, Vol. 2: Descriptive Linguistics*, Mouton, The Hague, 101–9.
- Williams, A. (2002) "Complex Causatives and Verbal Valence," dissertation proposal, University of Pennsylvania.
- Williams, E. (1985) "PRO and the subject of NP," *Natural Language and Linguistic Theory* 3:3, 297–315.