

# Prefixes, Scales and Grammatical Theory<sup>\*</sup>

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## 1 Introduction

This paper is concerned with the status of prominence scales in grammatical theory. It investigates the interaction of prefixation and the theta role scale and the case scale in Russian and Czech. We make a difference between particular scales - such as the case scale or the theta role scale - and the complex scale, which is composed of the two particular scales. We argue that the theta role scale and the case scale can be taken to be a reflection of syntactic structure and that they are determined by syntacticosemantic properties of the clause structure. The complex scale is a more interesting object. This scale is independent of syntactic structure and represents alignments of members of the theta role scale with members of the case scale. Although both types of scales are not necessary for deriving particular sentences, it is interesting that the complex scale – which itself is independent of the syntax - can predict the grammatical/markedness status of particular sentences. Thus, the complex scale, whose abstractions seem to express more general patterns, can also have a certain explanatory power in language. Concretely, we argue that the form of the complex scale of a particular sentence parallels grammatical principles and operations. There is a correlation between the type of the complex scale tree, syntactic operations and the morphological marking/grammatical status of the sentence. We show that only certain types of crossings in the complex scale tree, which correspond to certain types of syntactic processes, are allowed in the grammar.

## 2 Data

In this section, we introduce the core data. We investigate case and theta role properties of transitive and intransitive predicates and their interaction with prefixes.

### 2.1 Intransitive verbs

#### 2.1.1 Unprefixed intransitive verbs

We begin with unprefixed intransitive verbs. The argument of intransitive verbs typically bears nominative case, as shown in the Czech examples below. This holds for both unergative

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<sup>\*</sup> We would like to thank the audience at the *Workshop on Scales* (Leipzig, 2008) for valuable comments. Particular thanks go to Marc Richards for his insightful comments and helpful suggestions.

verbs, as in (1), and unaccusative verbs, as in (2). The (b) examples demonstrate that the single argument cannot bear the accusative marker. There are only a few unaccusative verbs assigning accusative case in Czech.

- (1) a. Pavel pracuje.  
       Pavel.NOM works  
       ‘Pavel is working.’  
       ‘Pavel works.’  
       b.\* Pavl-a pracuje.  
       Pavel-ACC works
- (2) a. Oper-a hoří.  
       opera-NOM burns  
       ‘The opera is burning.’  
       ‘The opera burns.’  
       b.\* Oper-u hoří.  
       opera-ACC burns

There are also special classes of verbs, such as unaccusative psych verbs, which take a nominative object (patient), as shown in the Czech example (3). Example (3b) demonstrates that the patient argument cannot be assigned accusative case. (3c) shows the same for the experiencer argument and (3d) shows that if both arguments are realized as prepositional phrases, the verb bears default agreement.<sup>1</sup>

- (3) a. Pavl-ovi se líbil-a ta nová pohádk-a.  
       Pavel-DAT self liked-SG.F the new story-SG.F.NOM  
       ‘Pavel enjoyed the new story.’  
       b.\* Pavl-ovi se líbil-a tu novou pohádk-u.  
       Pavel-DAT self liked-SG.F the new story-SG.F.ACC  
       c.\* Pavl-a se líbil-a ta nová pohádk-a.  
       Pavel-ACC self liked-SG.F the new story-SG.F.NOM  
       d. Pavl-ovi se líbil-o v Praze.  
       Pavel-DAT self liked-SG.N in Prague  
       ‘Pavel enjoyed Prague.’

Another verbal class with a less common case pattern is the class of experiencer verbs taking a nominative patient and an accusative experiencer, as illustrated in the Czech example (4a). Example (4b) shows that cases on the arguments cannot be switched: the experiencer cannot receive nominative and the patient accusative. (4c) then shows that in addition to the non-structural accusative on *Pavel*, the predicate cannot take another accusative argument.

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1. We assume that dative arguments are prepositional phrases, hence *Pavlovi* in (3) is a prepositional phrase with a covert preposition (cf. Emonds 2007b: chapter 5, 2007a).

- (4) a. Pavl-a bavit-a ta nová pohádk-a.  
 Pavel-ACC interested-SG.F the new story-SG.F.NOM  
 ‘Pavel was interested in/enjoyed the new story.’  
 b. \*Pavel bavit tu novou pohádk-u.  
 Pavel.NOM interested.SG.M the new story-SG.F.ACC  
 c. \*Pavl-a bavit-o tu novou pohádk-u.  
 Pavel-ACC interested-SG.N the new story-SG.F.ACC

### 2.1.2 Prefixed intransitive verbs

In this section, we investigate the question of what happens if a prefix is attached to intransitive verbs. As illustrated in the Russian example (5a), the stative predicate *měrz* ‘froze’ cannot be combined with the resultative prepositional phrase *v ajsberg* ‘in iceberg’. However, the prefix *v-* attached to the verb can license the directional prepositional phrase, as shown in (5b).

- (5) a. On mērz (\*v ajsberg).  
 he.NOM froze in iceberg.ACC  
 b. On v-mērz v ajsberg.  
 he.NOM in-froze in iceberg.ACC  
 ‘He froze in the/a iceberg.’

In cases where a directional prepositional phrase can be combined with an unprefix verb, prefixation brings about the result implication. In the Russian example (6a), there is an imperfective paradox; although there is an endpoint present in the sentence, it does not mean that he reached Moscow. In contrast, in (6b) the prefix *v-* brings about the telic type of perfectivity and the sentence means that he reached Moscow.

- (6) a. On echal v Moskv-u.  
 he.NOM drove in Moscow-ACC  
 ‘He was driving to Moscow.’  
 b. On v-echal v Moskv-u.  
 he.NOM in-drove in Moscow-ACC  
 ‘He drove to Moscow.’

Finally, the following Russian example shows that prefixes can also license an accusative object. In (7b) the verb *spal* ‘slept’ with the completive prefix *do-* ‘to’ can be combined with the accusative object *noč* ‘night’, in contrast to the unprefix verb in (7a).

- (7) a. On spal (\*noč).  
 he.NOM slept night.ACC  
 b. On do-spal noč.  
 he.NOM to-slept night.ACC  
 ‘He slept till the end of the night.’

We will now turn to transitive verbs. Let us begin with unprefixated predicates.

## 2.2 Transitive verbs

### 2.2.1 Unprefixated transitive verbs

Transitive verbs take a nominative and accusative argument. The nominative case occurs on the agent argument and the accusative case on the patient argument, as demonstrated in the Czech example (8a). Example (8b) shows that the reversed alignment is not possible. A nominative patient can only occur in passive constructions with the instrumental agent, as illustrated in (8c).

- (8) a. Pavel      bil      Jirka-u.  
       Pavel.NOM beat Jirka-ACC  
       ‘Pavel beat Jirka.’  
       b. Pavel      bil      Jirka-u.  
       Pavel.NOM beat Jirka-ACC  
       \* ‘Jirka beat Pavel.’  
       c. Pavel      byl      bit      Jirka-ou.  
       Pavel.NOM was beaten Jirka-INSTR  
       ‘Pavel was beaten by Jirka.’

### 2.2.2 Prefixed transitive verbs

Prefixes attached to transitive verbs either just induce perfectivity or they also add a prepositional phrase; compare the Russian examples (9a,b,c). Example (9c) demonstrates that the nominative marker typically occurs on the agent argument, the accusative marker on the patient and the oblique marker on the goal. As shown in example (9d), the reversed alignment of the patient argument and the goal argument is not possible.

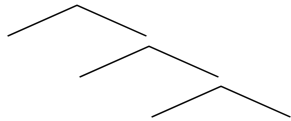
- (9) a. On      pisal      svoe imja.  
       he.NOM wrote self name.ACC  
       ‘He was writing his name.’  
       b.\* On      v-pisal      svoe imja.  
       he.NOM in-wrote self name.ACC  
       c. On      v-pisal      svoe imja      v knig-u      početa.  
       he.NOM in-wrote self name.ACC in book-ACC of honor  
       ‘He wrote his name in the book of honor.’  
       d.\* On      v-pisal      v imja      knig-u      početa.  
       he.NOM in-wrote in name.ACC book-ACC of honour

### 3 Scales

#### 3.1 Scales generally

Scales can be treated as hierarchies (certain approaches even use the term *hierarchy* instead of *scale*) and hierarchies in turn can be treated as a certain type of graph. In this paper, we will represent scales as trees, connected acyclic graphs, as schematized in (10). Taking (10) into consideration, it is obvious that scales have a structure. Consequently, relations between scale members can be based on structural relations like c-command.

(10)



Let us now turn to particular prominence scales. We follow the standard proposals (for the case scale see e.g. Bobaljik (2008b) and for the theta role scale see Forschergruppe 742 (2005)), as shown in (11a) and (11b).<sup>2</sup> (11a) means that nominative case is more prominent than accusative case and that accusative in turn is more prominent than dative or oblique case. Similarly, (11b) states that the agent theta role is more prominent than the patient theta role, which in turn is more prominent than the goal theta role.

(11) Prominence scales

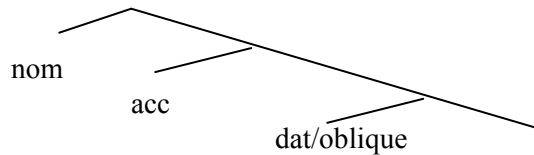
- a. Case scale: nominative > accusative > dative/oblique
- b. Theta role scale: agent > patient > goal

Combining the tree of c-command relations in (10) with the scales in (11) results in (12a) and (12b). The nominative case, since it is the most prominent scale member, c-commands the accusative case and the dative or oblique case and the accusative case in turn c-commands the dative or oblique case. In a parallel fashion, the agent theta role, which is the most prominent one, c-commands the patient theta role and the goal theta role, and the patient theta role c-commands the goal theta role.

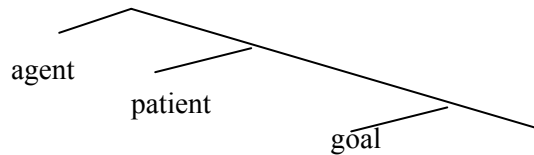
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2. Consider also the more general Case Realization Hierarchy (i) from Bobaljik (2008a, 2008b) and similarly Bittner and Hale (1996) and Marantz (2000). For our purposes, the case scale in (11a) is sufficient.  
(i) unmarked case > dependent case > lexical case

(12) a.

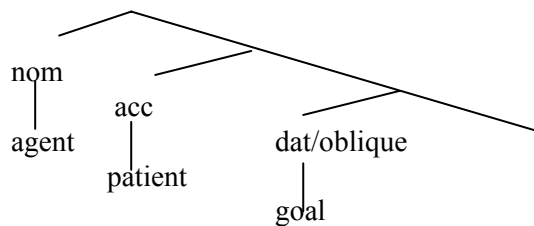


b.



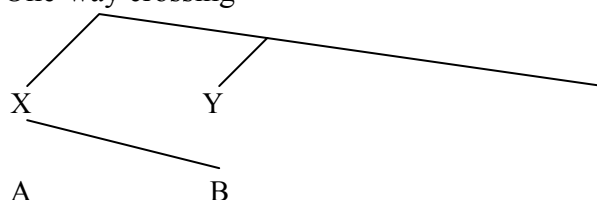
To get more interesting theoretical statements, the particular scales in (12a) and (12b) can be conjoined. Thus, if we keep the c-command relations between scale members and map members of one scale onto members of the other scale, we get the complex scale tree (13), as shown below. This complex scale tree in fact represents the unmarked harmonic alignment of six particular scale members.<sup>3</sup>

(13)



The generalization is that the unmarked alignment is a mapping between scale trees without crossing. To give a few examples of what we mean by a crossing, consider (14). In (14a) there is a one-way crossing, in (14b) a two-way crossing and in (14c) a two-way crossing, which in addition is reciprocal; we will see other types of complex scale trees in subsequent sections. A marked alignment then is mapping between scale trees with a crossing.<sup>4</sup>

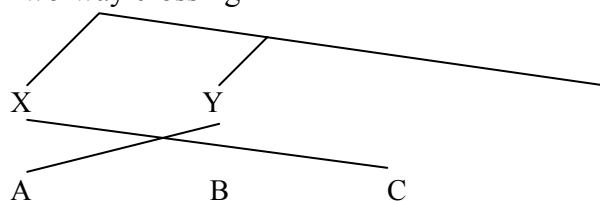
(14) a. One-way crossing



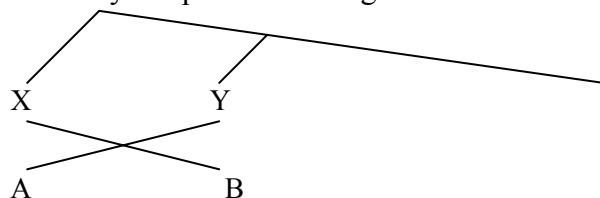
3. According to Aissen (2003: 441), harmonic alignment applies to pairs of scales and aligns each element on one with each element on the other and then generates constraint subhierarchies expressing the relative markedness of each such association.

4. Complex scale trees with crossings do not always satisfy the criteria for a tree but since nothing hinges on it here, we will call them trees as well.

b. Two-way crossing

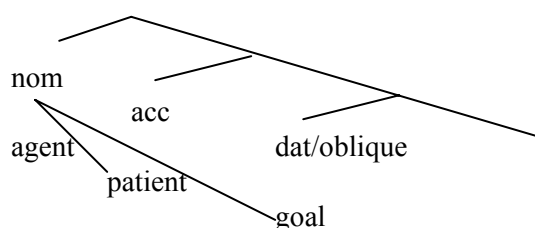


c. Two-way reciprocal crossing



In the complex scale tree, the degree of markedness can also be determined by the c-command relations. The patient theta role c-commands the goal theta role in the complex scale tree; therefore a goal with the nominative marker is more marked than a patient with the nominative marker (and a patient with the nominative case would be more marked than an agent), as demonstrated in (15) also by the crossings of different lengths.

(15)



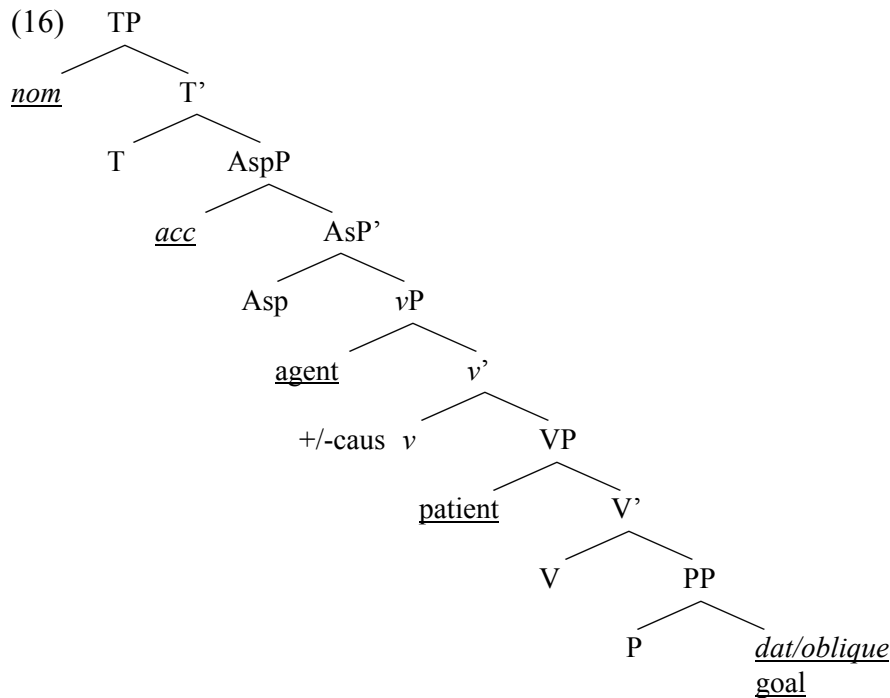
Markedness or crossings can go in both directions. Upwards, for instance, in the case of passivization in Czech, where the patient bears nominative, or downwards, like in the case of the antipassive voice in West Greenlandic, where the patient argument gets instrumental. It is important to note that this says nothing about the direction of operations in syntactic trees.

Languages generally do not have to express whole scales. Consider, for instance, case marking in ergative languages versus non-ergative languages. Languages also do not have to use whole scales in every sentence, as is obvious from cases like intransitive sentences.

### 3.2 Scales in a minimalist analysis

In this section, we deal with particular scales and show that both the theta role scale and the case scale are a reflection of the syntactic structure. Thus, they are determined by syntacticosemantic properties of the clause structure. The syntactic tree in (16) shows that both

prominence scales in fact emerge from the syntactic structure and that c-command relations between members of particular scales are preserved. We see that the theta role scale is sandwiched inside the case scale. This is a consequence of the fact that structural cases are structurally higher than nonstructural cases (leaving aside adjunction). Specifically, structural cases are assigned or valued in the functional domain by the tense head and the aspectual head through the operation Agree and languages may differ with respect to whether or not the agreeing arguments move to the specifier position of the appropriate projection.<sup>5</sup> And non-structural cases are assigned in the theta domain ( $\nu$ P) by the verb or prepositions through the operation External Merge.<sup>6</sup> One observes that only the goal argument and the dative or oblique case are mapped structurally, with unmarked harmonic alignment. The reason for this is that in the case of prepositional cases case goes hand in hand with the theta role.



The two prominence scales are (at least partially) determined by semantic properties of the syntactic structure. It is a well-known fact that there is a connection between structural cases and tense and aspect (e.g. Pesetsky and Torrego 2004). It has also been argued that tense and

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5. For arguments supporting the claim that structural accusative is assigned in AspP in Russian and Czech, see Biskup (2009).
  6. Compare Babby's (1987) Syntactic Case Hierarchy (i) and Franks's (1995) Case Hierarchy (ii):
    - (i) Lexical Case takes precedence over a Configurational Case.
    - (ii) a. the +Oblique Cases are assigned at D-Structure,  
b. the -Oblique Cases are assigned at S-Structure.



aspect relate two times (e.g. Klein 1995, Demirdache and Uribe-Etxebarria 1997). The head T can be treated as a dyadic operator that takes the reference time, which is related to AspP, and the speech time, and similarly the head Asp takes the event time, which is anchored in the verbal domain, and the reference time. Thus, T scopes over Asp and Asp over (the decomposed) vP. Therefore, nominative, which is connected to T, c-commands - is more prominent than – accusative, which is assigned in AspP. Accusative case then is more prominent than dative and oblique case, which are assigned in vP.

Parallel reasoning applies to the theta role scale. We assume that the event structure, that is vP, is decomposed. The (non-)causative *v* scopes over the process or stative V and V scopes over PP. Evidence for the event decomposition and ordering of subevents comes, for instance, from the contrast between the restitutive and the repetitive reading of the scope-taking adverb *again*. Von Stechow (1996) shows that in the restitutive reading, in contrast to the repetitive reading, *again* only scopes over VP (and PP) to the exclusion of vP. If theta roles are assigned configurationally as a result of DP-Merger (see Hale and Keyser 1993 and Ramchand 2008), then the agent theta role in Spec,vP c-commands - is more prominent than – the patient theta role in Spec,VP and the patient theta role in turn is more prominent than the goal theta role in PP.

## 4 Scales and derivations

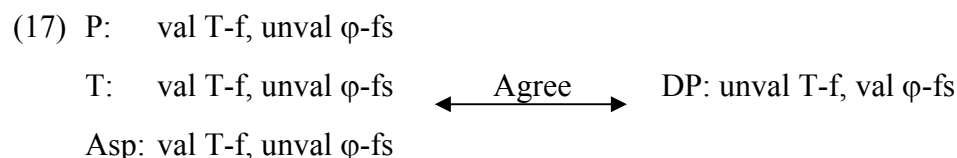
In this section, we investigate several syntactic derivations and complex scale trees. Although the complex scale tree is not part of the syntactic derivation and is not necessary for deriving particular sentences, its form corresponds to certain syntactic processes and the grammatical/markedness status of the sentence.

### 4.1 Unprefixed intransitive verbs

We saw in section 2 that the single argument of intransitive verbs is typically realized as nominative. What is the reason for this? A possible answer is that nominative is the most prominent case. Then the question arises how it works.

Firstly, we need to introduce some basic properties of our theoretical framework. Pesetsky and Torrego (2004, 2006) argue that there is a relation between nominative and tense properties of the sentence and between accusative and aspectual properties and propose that structural case is an unvalued Tense feature on the nominal head N or D and that it is valued by head T and T<sub>0</sub> (the aspectual head). Biskup (2007, 2009) extends their proposal and sug-

gests that all cases - not only structural cases - are an unvalued Tense feature on the nominal head D. This extension and the extension of  $\phi$ -features to P heads allows us to use the Tense feature on P in the case assigning process and also allows us to treat all cases uniformly with respect to the features participating in the case assigning relation. As shown in (17), the three heads P, T and Asp bear a valued Tense feature and unvalued  $\phi$ -features at a certain stage of the derivation and agree with a DP, which gets case as a consequence of the Agree operation.<sup>7</sup>



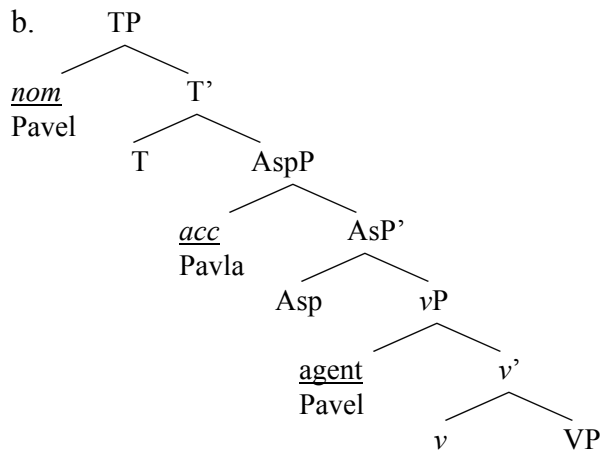
Biskup (2009) proposes that the Tense feature on DPs, that is cases, can be revalued. This means that a DP can get multiple cases, but since morphological principles of Russian and Czech do not allow multiple overt case markers on one element, they are not visible, in contrast to languages like Japanese, Kayardild, Korean or Lardil, which allow more case markers.<sup>8</sup> Therefore, in Russian and Czech, the structurally highest Tense value always appears on the particular DP. Let us now look at unprefixd unergative verbs. The derivation of (1a), repeated here as (18a), looks like (18b).

- (18) a. Pavel        pracuje.  
          Pavel.NOM works  
          ‘Pavel is working.’  
          ‘Pavel works.’

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7. The originally unvalued Tense feature on Asp is valued in the course of the derivation. Depending on whether or not a preposition (prepositions bear a valued Tense feature) incorporates into the verb, the verb emerges as perfective (prefixed) or as imperfective (unprefixed).

8. This means that we do not assume the Activity Condition. Data relying on the Activity Condition then need an alternative explanation.



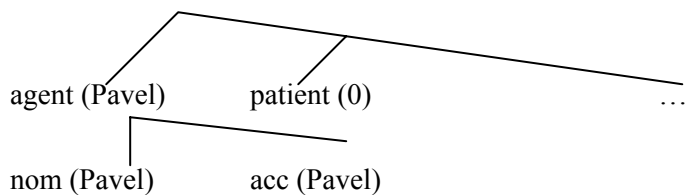
Agent *Pavel*, which is merged in Spec,vP, first agrees with the aspectual head and gets accusative. Given the principle of Full Interpretation in (19), which states that interfaces must contain only material that is interpretable (valued), unvalued  $\phi$ -features on the head T must also be valued.

(19) Full Interpretation (Chomsky 1995: 27)

...there can be no superfluous symbols in representations (the principle of Full Interpretation, FI)...

Thus, *Pavel* also agrees with the head T and its Tense value (case) is revalued. Consequently, it is spelled out with the nominative marker.<sup>9</sup> Concerning the complex scale tree, we receive a one-way type of crossing, as illustrated in (20). For expository reasons, we put the particular exponents of the case scale and the theta role scale into the complex scale tree (in brackets). Note that complex scale trees do not have to say anything about whether or not the particular exponents are identical elements; they are just meant to represent alignments between cases and theta roles.

(20) Complex scale tree of (18a)



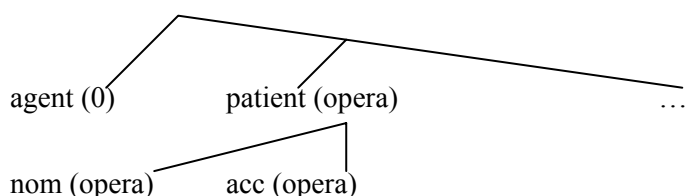
The tree demonstrates that the agent (*Pavel*) is marked with accusative case, which is usually unmarkedly aligned with the patient theta role; consider (13) again. It generally holds - not only for the language system - that a marked value or status is formally expressed (see e.g. Croft 1993 for a language typological point of view). However, there is no special verbal morphology (as e.g. in the case of passives) in (18a) and the argument is marked with the most unmarked case, namely, nominative. The reason for this is that there is no patient theta role in (18a). Thus, the morphologically unmarked alignment is a result of lacking the patient theta role, the principle of Full Interpretation and the case revaluation.

In the case of unprefixed unaccusative verbs, it works similarly. In (2a), which is repeated here as (21), patient *opera* bearing the unvalued Tense feature and valued  $\phi$ -features first agrees with the head Asp, which results in the accusative Tense value on *opera*, and then it agrees with the head T and gets the nominative Tense value. Since this is the last (highest) Tense value, *opera* is spelled out with the nominative marker.

- (21) Oper-a        hoří.  
       opera-NOM   burns  
       ‘The opera is burning.’  
       ‘The opera burns.’

In the complex scale tree (22), there is again a one-way crossing, now going from the patient theta role to nominative; compare (22) with the complex scale tree in (20). Similarly to the unergative example above, there is no special morphological marking on the elements in (21). The reason for this is that there is no agent theta role, as illustrated in (22).

- (22) Complex scale tree of (21)

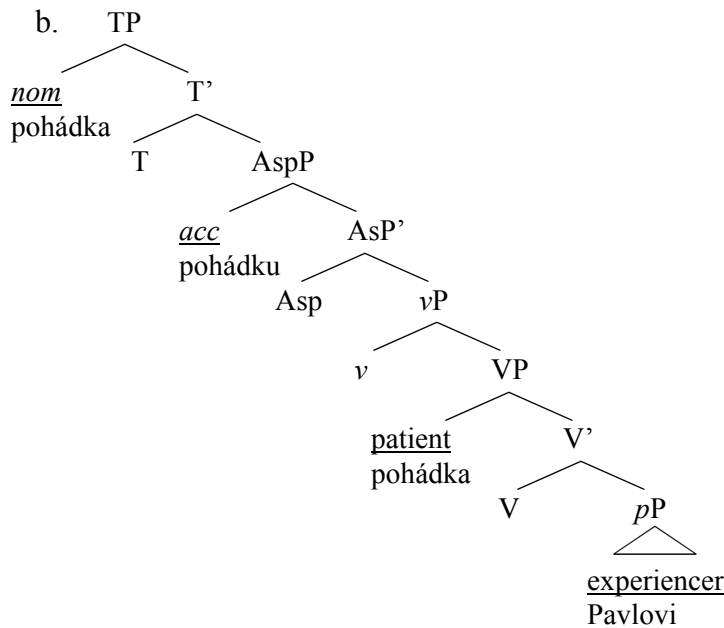



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9. It is not important here whether or not *Pavel* agrees with the heads Asp and T in situ. We put *Pavel* in Spec,AspP and Spec,TP just to show that it is marked with accusative and nominative case.

Let us now move to experiencer unaccusative verbs. Given the Binding Principle A asymmetries between the patient and the experiencer argument, we analyze example (23a)=(3a) as shown in (23b).<sup>10</sup>

- (23) a. Pavl-ovi se líbil-a ta nová pohádk-a.  
 Pavel-DAT self liked-SG.F the new story-SG.F.NOM  
 ‘Pavel enjoyed the new story.’



Given the principle of Full Interpretation, unvalued  $\phi$ -features on the heads Asp and T must be valued. This job is done by the patient argument *pohádka*. If all *v*Ps are phases (that is, unaccusative *v*Ps too) as argued by Legate (2003), then the patient argument must raise to the edge of *v*P. Then it agrees with the head Asp and T, which results in accusative and nominative case, as demonstrated in (23b). The final word order of (23a) is achieved by the topicalization movement of *Pavlovi*. Note that *Pavlovi* precedes the Wackernagel clitic *se*, which is standardly assumed to occur in a head position in the C domain.

10. The following example shows that the patient argument can bind into the dative experiencer (ia) and that in contrast the experiencer cannot bind into the patient (ib), which should be possible if the patient were generated below the experiencer. The control example (ic) shows that the ungrammaticality of (ib) is not due to the fact that the possessive reflexive is contained in the nominative argument.

- (i) a. Ten nový student se líbí své profesorce.  
 the new student.M.NOM self likes self.F.DAT professor.F.DAT  
 ‘The professor likes his new student.’  
 b. \* Svůj student se líbí profesorce.  
 self.M.NOM student.M.NOM self likes professor.F.DAT  
 c. Pavel také vystupuje jako svůj žalobce.  
 Pavel.M.NOM also acts as self.M.NOM accuser.M.NOM  
 ‘Pavel also acts as the accuser of himself.’

It cannot be the dative argument *Pavlovi* that values unvalued  $\phi$ -features on the heads Asp and T. We assume that nonstructural cases like the dative here are prepositional phrases, hence *Pavlovi* in (23a) is a prepositional phrase with a covert preposition, like in the case of free datives. Biskup (2009) proposes that the Tense value of the prepositional complement cannot be revalued because prepositional phrases are phases, that is, *p*Ps (see Abels 2003, who argues that prepositional phrases in Russian and other Slavic languages are phases). Since *Pavlovi* is trapped in the phase complement, then, given the Phase Impenetrability Condition (Chomsky 2000) in (24), it cannot enter into an Agree relation with  $\phi$ -features on Asp and T and its dative case cannot be revalued as accusative or nominative.

(24) Phase Impenetrability Condition (Chomsky 2000: 108)

In phase  $\alpha$  with head H, the domain of H is not accessible to operations outside  $\alpha$ ; only H and its edge are accessible to such operations.

The phase status of the prepositional phrase, however, is not the only relevant factor since there are phases that allow extraction out of their complement, like *v*P phases. Another relevant factor is the ability of the appropriate argument to escape the phase. In this respect, we follow Biskup (2009) and Biskup and Putnam (to appear), who propose that it is a certain type of the Tense feature that is responsible for the blocking of extraction. For instance, Biskup and Putnam (to appear) propose that the prepositional complement cannot be extracted because of the A-over-A principle applied to categories with the bounded Tense feature. More concretely, since the head P bears a Tense feature with the value bounded and projects the category PP and this category includes the prepositional complement whose Tense feature has been valued as bounded, the complement cannot move across PP.

The fact that there is a default agreement on the predicate in (3d), repeated for convenience as (25), shows that prepositional complements (*Pavlovi* and *Praze*) indeed are not accessible for Asp and T and the operation Agree.<sup>11</sup>

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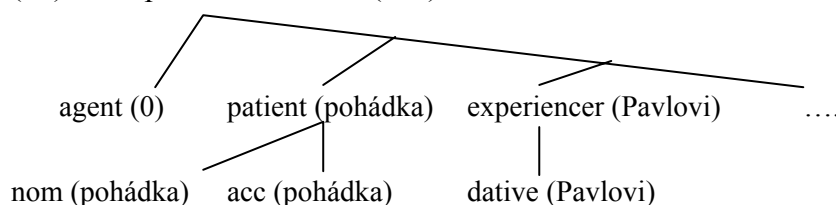
11. Dative experiencer constructions like (i), we analyze in the way that probes on the head Asp and T are valued by the postcopular adverbial, which in fact is a nominative DP, as argued by Caha and Medová (2009).

(i) Mně je zim-a / tepl-o.  
 I.DAT is coldness-SG.F.NOM warmth-SG.N.NOM  
 ‘I am cold/warm.’

- (25) Pavl-ovi se líbil-o v Praze.  
 Pavel-DAT self liked-SG.N in Prague  
 'Pavel enjoyed Prague.'

The complex scale tree of (23a) is shown in (26). There is an unaccusative one-way crossing combined with the unmarked alignment of the experiencer with dative. Since the harmonic alignment of the experiencer theta role with the dative case is unmarked and there is no agent theta role - as in the case of the unaccusative complex scale tree - there is no reason for a special morphological marking (*se* in the predicate *líbit se* does not represent a special morphological marking because *líbit* cannot occur by itself).

- (26) Complex scale tree of (23a)



From the syntactic point of view, the morphologically unmarked alignment is a result of lacking the agent theta role, the principle of Full Interpretation and the impossibility of the revaluation of case on the prepositional complement.

In section 1 we saw that there is also a special class of experiencer verbs taking a nominative patient and an accusative experiencer. These verbs can be analyzed in the same way as the dative experiencer verbs. As to example (27a)=(4a), we just put *Pavla* in the tree in (23b) instead of *Pavlovi* and change the predicate. As above, the experiencer argument is trapped in the phase complement of the covert preposition, hence its nonstructural accusative case cannot be revalued by nominative; therefore example (27b)=(4b) is ungrammatical.<sup>12</sup> The example in (27c)=(4c) shows that in addition to *Pavla* with the nonstructural accusative case, the predicate cannot take another accusative argument, which seems to be counterintuitive. How-

12. Compare accusative experiencer verbs in other languages, e.g., *interessieren*-type verbs in German (Sternefeld 2006), for some other languages see Pesetsky (1995). It is necessary to differentiate between the experiencer verb *bavit*, as in (27a), and the agentive *bavit*, as shown in (i). In contrast to (27a), the accusative case in (ia) is structural, therefore passivization is possible, as demonstrated in (ib).

(i) a. Jan-a bavila Pavl-a.  
 Jana-NOM amused Pavel-ACC  
 'Jana amused Pavel.'  
 b. Pavel byl baven Jan-ou.  
 Pavel.NOM was amused Jana-INTR  
 'Pavel was amused by Jana.'

ever, unvalued  $\phi$ -features on the head T must also be valued, which results in revaluing the structural accusative on *tu novou pohádku*.<sup>13</sup>

- (27) a. Pavl-a      bavił-a              ta    nová pohádk-a.  
          Pavel-ACC interested-SG.F    the new    story-SG.F.NOM  
          ‘Pavel was interested in/enjoyed the new story.’  
       b.\* Pavel      bavił              tu    novou pohádk-u.  
          Pavel.NOM interested.SG.M    the new    story-SG.F.ACC  
       c.\* Pavl-a      bavił-o              tu    novou pohádk-u.  
          Pavel-ACC interested-SG.N    the new    story-SG.F.ACC

Concerning the complex scale tree, we propose an analysis parallel to dative experiencer verbs; the only difference is that we put *nonstructural accusative* instead of *dative* in the tree in (26).

## 4.2 Prefixed intransitive verbs

Example (5), repeated here as (28), shows that if the stative predicate *měrz* ‘froze’ is prefixed, it can be combined with the resultative prepositional phrase *v ajsberg* ‘in iceberg’. Biskup (2007, 2009, to appear) argues that verbal prefixes are a spellout of a P element incorporated into the verb and that the valued Tense feature on the incorporated P element values the unvalued Tense feature on the aspectual head. This brings about perfectivity, concretely, in the case of (28b), the telic type of perfectivity, which licenses the resultative *pP v ajsberg*.

- (28) a. On            mērz    (\*v    ajsberg).  
          he.NOM    froze    in    iceberg.ACC  
       b. On            v-mērz    v    ajsberg.  
          he.NOM    in-froze    in    iceberg.ACC  
          ‘He froze in the/a iceberg.’

Since prepositions are standardly analyzed as two-place predicates – as S/N/N or  $\langle e, \langle e, t \rangle \rangle$  or  $\langle l, \langle l, t \rangle \rangle$ , see Bierwisch (1988), Heim and Kratzer (1998), von Stechow (2006, 2007), respectively – that is, they localize the external argument with respect to the internal argument, we decompose prepositional phrases into PP and *pP*, following Talmy (1978) and Svenonius (2004). The internal argument is selected by the head P and is called *ground*, and the external

13. As pointed out to us by Marc Richards, our approach predicts that there are no single argument accusative intransitives, hence constructions like accusative unaccusatives may pose a problem for our analysis. With respect to these constructions, we follow Lavine and Freidin (2002), see also Harves (2006), who propose that T is a  $\phi$ -incomplete head that does not have to enter into an Agree relation with an argument bearing  $\phi$ -features.



argument, which is called *figure*, is introduced by the head *p*. The figure argument is the entity that is located, moved or somehow characterized with respect to the ground argument. Given this, (28b) is derived as shown in (29).<sup>14</sup>

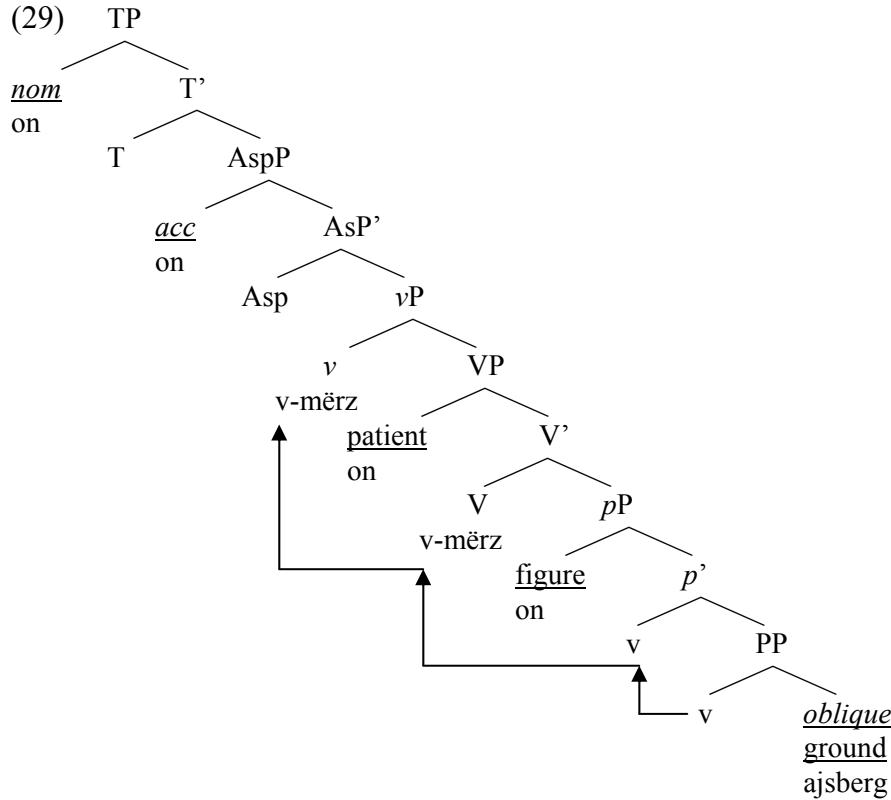


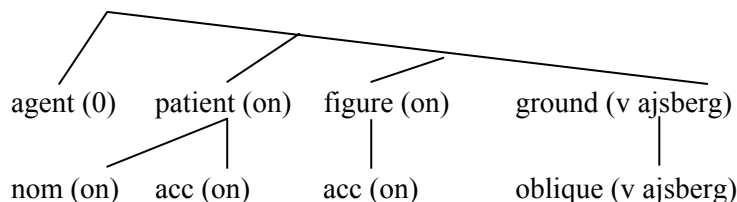
Figure arguments typically get accusative (which is revalued by nominative in intransitive constructions), hence this is the unmarked harmonic alignment and we put the accusative case on the case scale twice, as shown in (30). We assume that arguments can get multiple theta roles (see e.g. Hornstein 1999) and that every subevent must have an argument (Levin and Rappaport Hovav 2004).<sup>15</sup> From the scale point of view, movement (and the operation Agree) of *on* in the syntactic derivation (29) is represented as the unaccusative type of crossing with the unmarked alignment of figure with structural accusative combined with the unmarked alignment of the ground argument with oblique, as demonstrated in the complex scale tree

14. We put *on* in the specifier positions of Asp and T just for expository reasons, to show that it receives accusative and nominative (the same holds for the following syntactic trees). We are indifferent with respect to the final position of *on*. If every *vP* is a phase, then *on* must appear at least at the edge of *vP*.

15. Given the fact that arguments can bear more theta roles and more cases, it may seem that our approach overgenerates with respect to possible argument structures. To avoid this complication, we assume in line with Ramchand (2008) that verbs are specified with respect to which subevents they can instantiate, which arguments they license, and whether or not the arguments can be identical.

(30).<sup>16</sup> Given this unaccusative one-way crossing and the two unmarked alignments, we do not observe any special morphological marking in sentence (28b).

(30) Complex scale tree of (28b)



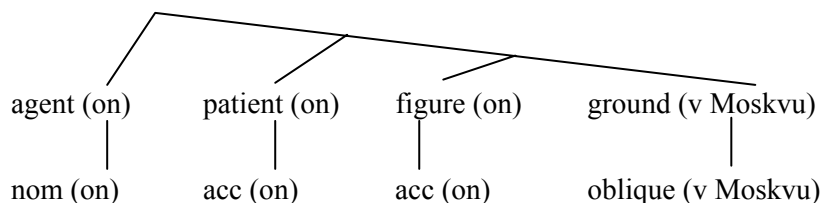
In contrast to the stative verb in (28), the motion verb *echal* ‘drove’ can be combined with a directional prepositional phrase, as shown in the following example. Since motion verbs have a path in their meaning, the directional prepositional phrase *v Moskvu* ‘in Moscow’ can be mapped onto the path of the event *echal* in (31a). In example (31b), the prefix *v-* incorporated into the verb values the Tense feature on the aspectual head, this again brings about the telic type of perfectivity, hence the sentence means that he reached Moscow, in contrast to the imperfective example (31a).

- (31) a. On      *echal*   *v*   *Moskv-u*.  
          he.NOM   drove   in   Moscow-ACC  
          ‘He was driving to Moscow.’  
       b. On      *v-echal*   *v*   *Moskv-u*.  
          he.NOM   in-drove   in   Moscow-ACC  
          ‘He drove to Moscow.’

The event of *echal* has an agent and *on* bears the agent, patient and figure theta roles. At the same time, *on* bears nominative and structural accusative. Consequently, we arrive at the unmarked harmonic alignment of the agent theta role with nominative case, the patient with accusative case, the figure with accusative and the ground with oblique, as demonstrated in the complex scale tree (32). As to the markedness status, the complex scale tree (32) seems to be less marked than the one in (30). A comparison of the complex scale trees (30) and (32) and their appropriate sentences (28b) and (31) shows that the one-way type of crossing with the missing agent argument plays no role for morphological marking, as we already saw in the case of (20) and (22).

16. As already mentioned, since complex scale trees are not meant to represent identity between particular exponents on the scales, there is no linking between the patient and the accusative below the figure or between the figure and the accusative below the patient. From now on, the term *goal* will be replaced with *ground*.

(32) Complex scale tree of (31)



In section 1, we showed that prefixes can also add an argument with structural accusative; consider example (7)=(33) again. Since verbal prefixes are incorporated prepositions, they add a prepositional phrase to the verbal argument structure, which means that they also add new argument positions. This happens in the case of (33b), where *noč* ‘night’ is merged as the figure argument in Spec,*pP*.

- (33) a. On spal (\*noč).  
           he.NOM slept night.ACC  
       b. On do-spal noč.  
           he.NOM to-slept night.ACC  
           ‘He slept till the end of the night.’

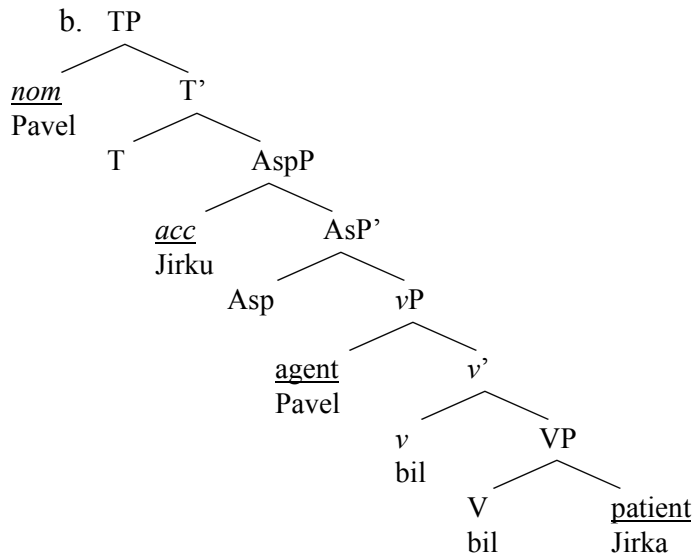
The ground argument is implicit in (33b). Taking into consideration the interpretation of this sentence and the prefix *do-*, the ground can be something like *do konca* ‘till the end’.

### 4.3 Unprefixed transitive verbs

We will begin this section with the unmarked harmonic alignment of transitive verbs; consider example (34)=(8a). Given the Case Filter, every DP must have a case. However, the patient argument *Jirka* is not accessible for the head Asp and T because of the Phase Impenetrability Condition. Therefore, it must be moved by an Edge Feature to the edge of *vP*, more specifically, in accordance with the Extension Condition to the outer Spec,*vP*. In this position, *Jirka* can agree with the head Asp and its Tense feature is valued as accusative. Theoretically, the Tense feature on *Jirka* could be revalued by the head T as nominative – note that *Jirka* is closer to T than *Pavel* - but then *Pavel* would have no case and the derivation would crash, violating the Case Filter. Thus, *Pavel* must move. Note that *Pavel* precedes *Jirka* and can be interpreted as backgrounded (scrambled) in (34a). Since scrambled elements can take scope over negation (Biskup 2011) and negation is standardly positioned between T and Asp in Slavic, then in (34), where no negation is present, *Pavel* scrambles (at least) to the specifier position of AspP. Since *Jirka* does not bear a Scrambling feature, in contrast to *Pavel*, it can-

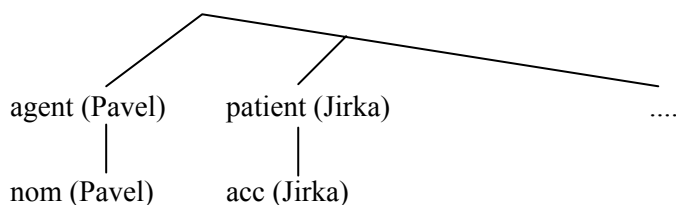
not block movement of *Pavel*. In the scrambled position then *Pavel* agrees with T and gets nominative case.

- (34) a. Pavel      bil    Jirk-u.  
           Pavel.NOM beat Jirka-ACC  
           ‘Pavel beat Jirka.’



The form of the complex scale tree (35) corresponds to the syntactic tree (34b), which shows the alignment of *Pavel* and *Jirka*, not their overt syntactic positions. The unmarked alignment of the agent theta role with nominative and the patient theta role with accusative reflects the two Agree operations (and movements): between *Jirka* and Asp and between *Pavel* and T, which in turn are determined by syntactic conditions like the Phase Impenetrability Condition and the Case Filter. Since there are two unmarked harmonic alignments, hence no crossings in the complex scale tree, there is no special morphological marking in (34a).

- (35) Complex scale tree of (34a)



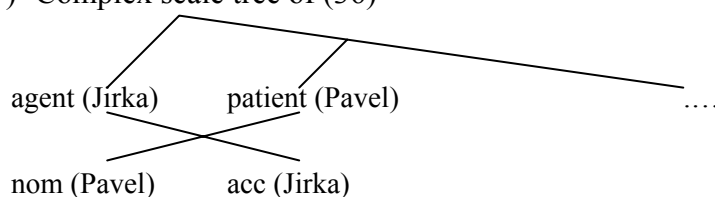
As demonstrated in example (8b), for convenience repeated as (36), the reversed alignment of the agent and patient argument is ungrammatical. The ungrammatical status is due to the violation of minimality principles. Following the argumentation above, in the derivation of sen-

tence (36), the patient argument *Pavel* must move to the edge of *vP* across the agent argument *Jirka*. Then, however, the operation Agree between the aspectual head and *Jirka* (note that *Jirka* is marked with accusative) crosses *Pavel* in the outer Spec,*vP*.

- (36) Pavel        bil    Jirk-u.  
       Pavel.NOM beat Jirka-ACC  
       \* ‘Jirka beat Pavel.’

The complex scale tree of example (36) looks like (37). There is a two-way type of crossing that is reciprocal. Although (36) is ungrammatical because of the violation of minimality, the example seems to suggest that there is a relation between the reciprocal two-way type of crossing and the ungrammatical status. Generally speaking, if two entities interchange their forms, one cannot expect that the state of affairs remains normal. It is obvious that it is not just a language matter; consider, for instance, mistaken identity comedies.

- (37) Complex scale tree of (36)

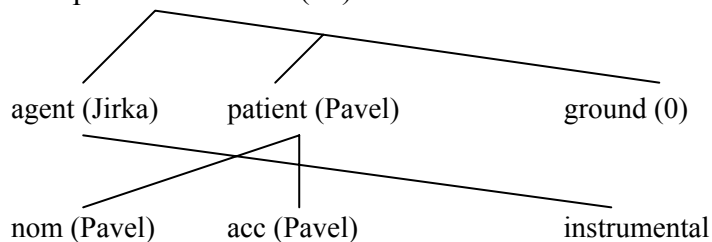


The way out of this problem is to mark the change. The state of affairs must be somehow repaired. Exactly this happens in the case of the passive sentence in (38); therefore the example is grammatical.

- (38) Pavel        byl    bit        Jirk-ou.  
       Pavel.NOM was    beaten Jirka-INSTR  
       ‘Pavel was beaten by Jirka.’

If you take a look at the complex scale tree (39), you can see that the agent argument is marked with instrumental instead of the accusative case. Although there is a two-way type of crossing, as in (37) above, the crucial fact is that the crossing is not reciprocal. Note also that the verbal morphology in example (38) is more marked than the one in (36); it is more complex (see Greenberg 1966 and Croft 1993, who argue that according to the structural markedness criterion, passives are usually more marked).

(39) Complex scale tree of (38)



To show that this pattern is more general (not restricted only to language), consider a story from a fancy-dress party. The story nicely illustrates why the non-reciprocal two-way crossing is better than the reciprocal two-way crossing and worse than no crossing in the complex scale tree. Pavel dates Jana but he is going to split with her because he just began to be involved with Julie. He knows that at the fancy-dress party, Jana will wear a Snow White mask and Julie a cat mask. Imagine that in the evening, at the fancy-dress party, Pavel will come to the Snow White and tell her that their relationship is over and then he will tell the cat that he loves her. If the girls wear the right masks - if there is no crossing in the complex scale - then things go well for Pavel. However, if the girls exchange their masks – this is the reciprocal two-way crossing - Pavel will have two problems. Now consider the third scenario, that is, the morphologically marked case with the non-reciprocal two-way crossing. If Jana borrows Julie's mask and Julie borrows a mask from someone else, then Pavel will have only one problem.

Let us illustrate it with another example. Imagine a situation with two trains leaving at the same time and going at the same speed. The first train is going from X to B, the second one from Y to A and both are going on straight railway lines that cross in the middle, as shown by the reciprocal two-way crossing in (14c). In this case, the trains will crash into each other. In contrast, in the case of the non-reciprocal two-way crossing, as shown in (14b), the trains will not crash because the train from X to C must go a longer distance to the crossing point. In the case of the one-way crossing, as demonstrated in (14a), there is even no potentiality of crash because there is only one railway line. Similarly, in the case of unmarked alignment (one train goes from X to A and the second one from Y to B) crash is impossible.

As far as the syntactic derivation of (38) is concerned, the agent argument *Jirka* is trapped in the instrumental *pP* phase; therefore its Tense feature cannot be revalued by the head Asp or T and it is the Tense feature on *Pavel* that must agree with Asp and then with T.

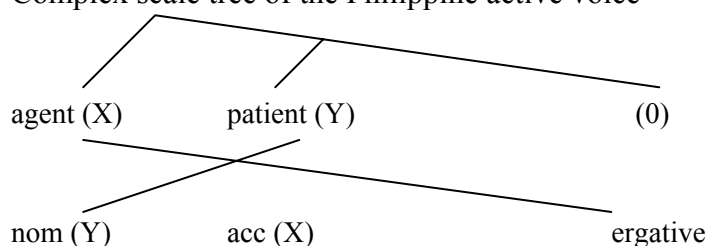
Our analysis is supported by the following facts from Philippine languages. A closer look at (40) with the Philippine-type voice system reveals that the passive voice is the unmarked alignment and that ergative case is used instead of accusative in the active voice.

(40)

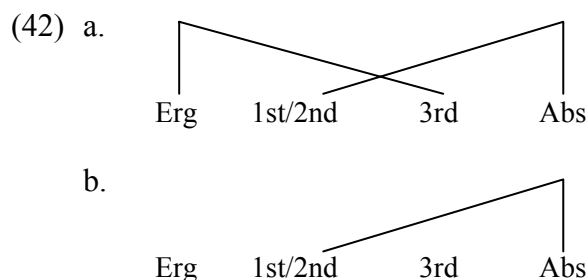
active voice	passive voice
nom/direct (patient)	nom/direct (agent)
ergative (agent)	accusative (patient)

The situation in the active voice seems to be analogous to the passive example (38). The reciprocal crossing in the Philippine active voice must be somehow repaired, therefore ergative - which is often taken to be nonstructural (inherent) case; hence it can be put in the position of instrumental in (39) - replaces accusative, as demonstrated in the following complex scale tree.

(41) Complex scale tree of the Philippine active voice



Another support for our analysis comes from Rosen (1990). As pointed out to us by Fabian Heck (p.c.), Rosen analyzes the person/animacy hierarchy and the case hierarchy in Southern Tiwa in terms of a tiered model reminiscent of autosegmental phonology. What is important here is that according to Rosen, the hierarchy graph with crossing association lines is a prohibited configuration (for a purely syntactic approach, see Heck and Richards 2010). More concretely, Southern Tiwa does not have clauses like *The snake bit me* with a third person ergative and a first or second person absolutive. Such clauses represent the illicit configuration; consider the hierarchy graph with crossing lines in (42a), taken from Rosen (1990: 676), which resembles our reciprocal two-way crossing. Instead, Southern Tiwa uses the passive construction *I was bitten by the snake*, which represents the possible configuration; compare Rosen's graph (1990: 676) in (42b). This is in line with the Well-Formedness Condition on association lines in autosegmental phonology. Note that in our mapped complex scale tree, it is not the crossing itself but the two-way reciprocal crossing that is illicit.

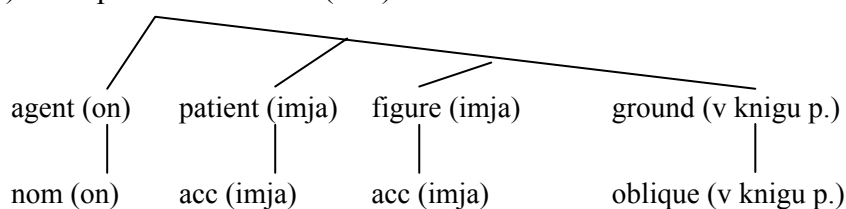


#### 4.4 Prefixed transitive verbs

We have seen that verbal prefixes are incorporated prepositions, therefore they can add a prepositional phrase to the verbal argument structure; consider the contrast between (43a) and (43b). Sentence (43b) is represented by the complex scale tree in (44). There are four bidirectional unmarked harmonic alignments. The agent theta role is aligned with nominative, the patient theta role with accusative, the figure argument with accusative and the ground argument with the oblique case. Given these unmarked alignments, we do not observe any special morphological marking in sentence (43b).

- (43) a. \* On v-pisal svoe imja.  
           he.NOM in-wrote self name.ACC  
       b. On v-pisal svoe imja v knig-u početa.  
           he.NOM in-wrote self name.ACC in book-ACC of honor  
           ‘He wrote his name in the book of honor.’  
       c. \* On v-pisal v imja knig-u početa.  
           he.NOM in-wrote in name.ACC book-ACC of honour

(44) Complex scale tree of (43b)



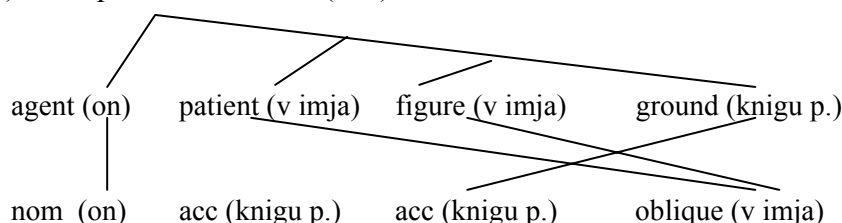
The example in (43c)=(9d) demonstrates that the reversed alignment of the figure (and patient) argument and the ground argument is not possible. *V imja* ‘in name’ cannot be interpreted as the figure argument and *knigu početa* ‘book of honour’ bearing structural accusative cannot be interpreted as the ground.<sup>17</sup> The complex scale tree of (43c) then looks like (45).

17. At first glance, in cases with more symmetrical arguments, the reversed alignment seems to be possible; see  
 (i). In fact, it is not a reversed alignment; the prepositional argument is always interpreted as the ground argument.  
 (i) a. He stirred apple sauce into water.  
       b. He stirred water into apple sauce.



We again see the problematic reciprocal two-way crossing (plus the crossing going from the patient theta role to the oblique case and the unmarked alignment of the agent with nominative); hence, as expected, the sentence is ungrammatical.

(45) Complex scale tree of (43c)



From the syntactic point of view, the problem lies in the fact that there are solid relationships in the prepositional phrase. Assuming that theta roles are assigned configurationally as a result of the DP-Merger, the argument merged in Spec,*pP* must be the figure and the argument merged as the complement of P must be the ground (see Svenonius 2004). Since the ground argument is trapped in the complement of the *pP* phase, it is not accessible for operations outside the *pP* phase and cannot get structural accusative. In addition, as discussed in section 4.1, the unvalued  $\phi$ -features of the preposition are valued by its complement, that is, by the ground argument. Therefore, the preposition cannot serve as a probe anymore and assign case to the figure argument.

There is no way to repair the reciprocal two-way crossing in (43c) with morphological marking, in contrast to the passive construction (38) and the Philippine active voice in (40). However, there are languages that have repairing tools for cases like this. Chukchi, which is an ergative language, has conversive antipassive constructions, in which the ground argument is promoted to the direct object and gets absolutive when the direct object, that is the figure, is demoted and gets oblique case, as demonstrated in (46), taken from Bobaljik (2007: 180-181, originally Kozinsky et al. 1988: 663-665).

- (46) a. ətɬəy-e      təkɛčʔ-ən    utkuč-ək    peɬa-nen  
 father-ERG    bait-ABS    trap-LOC    leave-3SG>3SG  
 ‘Father left the bait at/in the trap.’  
 b. ətɬəy-e      təkɛčʔ-a    utkuč-ən    ena-peɬa-nen  
 father-ERG    bait-INSTR    trap-ABS    AP-leave-3SG>3SG  
 ‘Father left the bait at/in the trap.’

The illicit two-way reciprocal crossing is repaired similarly to the examples in the preceding section; the predicate receives a special morphological marking, that is, the antipassive mor-

pheme *ena*, and the figure argument gets instrumental, instead of the reciprocal locative case, as shown by example (46b).

## 5. Conclusion

We have argued that the theta role scale and the case scale are a reflection of syntactic structure; hence they are determined by c-command relations and semantic properties of the clause structure. As far as prefixes are concerned, we have shown that they can license case and add arguments to the verbal argument structure. In this way, they make the lower part of scales more complex. We wanted draw attention to the fact that the complex scale expresses patterns more general than just language ones and that it can have a certain explanatory power in language. The form of the complex scale of particular sentences corresponds to grammatical principles, such as the principle of Full Interpretation and the Case Filter, and grammatical operations, such as the operation Agree and Move. We have drawn a parallel between the type of the complex scale tree, syntactic operations and the morphological marking/grammatical status of the sentence. Certain types of the complex scale tree correspond to the grammatical status, for instance, complex scale trees with the one-way crossing and a missing argument, certain types correspond to the morphologically marked status - complex scale trees with the non-reciprocal two-way crossing - and other types correspond to the ungrammatical status, the complex scale trees with the reciprocal two-way crossing. Although the complex scale tree of a particular sentence corresponds to grammatical principles and operations, the information about which types of the complex scale tree are problematic and which ones are not is of general nature and does not belong to the grammar itself.

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