

Semantics of Case

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Abstract This paper presents a framework which connects case assignment with the semantics of argument realization. Broad notions of agency and affectedness are decomposed into more fine-grained semantic properties, loosely based on Dowty's Proto-Role theory, but conceived in terms of privative opposition and organized into a lattice. This lattice provides a semantic space of participant properties and supports defining hierarchical relations among participant types, interpreted as semantic prominence, as well as topological relations such as 'closeness', interpreted as semantic similarity between participant types. Cases are defined as connected regions of this space, relating a given case to a structured set of semantic properties. A case system is represented as a semantic system, which embodies oppositions and contrasts, and operates against the backdrop of the general semantics of argument realization, where one can define notions such as maximal agents and maximal patients and represent generalizations from the research on transitivity. Core case markers (e.g. ergative, accusative) are represented as subspaces of the lattice spreading outwards from the maximal agent and maximal patient nodes of the lattice. Case alternations arise when the subspace of the lattice delimited by a predicate's entailments for an argument is partitioned by different cases, exemplified with the genitive/accusative alternation in Russian occurring with direct objects of certain intensional predicates. This method also provides a treatment of case polysemy, viz. a single case subsuming multiple uses, by relating the diverse uses at the more abstract semantic level of the case's region on the lattice, demonstrated with non-canonical uses of the dative.

Keywords Case · Transitivity · Proto-Roles · Dative · Russian Genitive

1 Introduction

This paper develops a view of case assignment that places verbal semantics at the center of case marking. Research on case has shown that the use of case markers aligns with semantic content on a quite general level: the connection between case as a marker of

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grammatical function, such as subject or object, and the semantics of participant types has been a mainstay in work on case at least since Fillmore (1968). This connection has been sharpened from a typological perspective in the literature on ‘transitivity’ (Hopper and Thompson 1980, Tsunoda 1981, Malchukov 2005, Næss 2007) where it is proposed that the likelihood a predicate assigns canonical case (viz. nominative/accusative or ergative/absolutive) follows from the degree to which the argument of the predicate qualifies as canonical participants in a ‘transitive’ event, exemplified by arguments of verbs referred to by Tsunoda (1985) as resultative effective action verbs, such as *break* or *kill*.

In addition to the general semantics relating case marking to notions such as *agent* and *patient*, case alternations, which exhibit systematic semantic contrasts, demonstrate that case assignment is intertwined with semantics. This is a general issue inasmuch as case alternations occur across languages and syntactic positions. For example, the sentences in (1)¹ form a minimal pair, differing only in the case marker, which marks a contrast between volitional and non-volitional action in intransitives.

(1) Hindi/Urdu

- a. Ram k^has-a
Ram.M.NOM cough-PERF.M.SG
Ram coughed.
- b. Ram=ne k^has-a
Ram.M=ERG cough-PERF.M.SG
Ram coughed (purposefully). (Tuite, Agha and Graczyk 1985:264)

A second alternation in (2), which I will discuss further in section 5.2, shows that for certain predicates in Russian the realization of the accusative or the genitive case correlates with a contrast between a specific and non-specific reading.

(2) Russian

- a. Ivan ždēt tramvaj
Ivan wait-for.PRES tram.ACC
Ivan is waiting for the/a certain tram.
- b. Ivan ždēt tramvaj-a
Ivan wait-for.PRES tram-GEN
Ivan is waiting for a tram. (Wierzbicka 1981:56)

The examples in (1) and (2) further demonstrate that case alternations may involve a variety of semantic notions, here volitionality and definiteness.

The two points addressed above indicate that a theory of case must address both the connection between case and grammatical function as well as provide a natural explanation for additional semantic contrasts. In this paper, I construct a semantic theory of argument realization by establishing a set of properties of participants in events, such as *motion* and *volition*, and then generate the hierarchical structure implicit in those properties and their combinations in the form of a lattice. This lattice provides a semantic space of participant properties upon which a case is defined as a connected region of this space, i.e. as a structured set of semantic properties. Through

¹ Glosses and abbreviations are based on the Leipzig Glossing Rules.

this approach, a case system is represented as a semantic system, which embodies oppositions and contrasts, and operates against the backdrop of the general semantics of argument realization. This results in a perspective which unifies uses of case to mark grammatical functions (subject, object, etc.) and uses which provide specific semantic contrasts.

Pursuing a view of case assignment in which semantics takes the leading role also provides a new perspective on the issue of case polysemy, i.e. the multiple uses within a language subsumed by a single case, which can be both syntactic and semantic in nature. This situation is exemplified by the functions of the Ancient Greek dative, which include syntactic notions such as indirect object as well as semantic functions such as the instrumental, the dative of possession and the dative of agent (Smyth 1920). In addition, across languages, the semantic and functional range of cases which share the same label are not necessarily identical. Despite the frequency with which labels such as “dative” are used, often what is termed a “dative” in one language only shares a few of the functions of a case in another language with the same label “dative”. Ideally, a theory of case should articulate the commonality among the diverse uses of a given case in a particular language and give voice to the similarities among certain cases across languages which merit the application of the same label. The tension between a single case marker and multiple functions led Jakobson (1936) to regard a case as possessing a general meaning from which specific meanings are derived. This paper pursues a similar strategy: the semantic content of a case must answer for its diverse uses and expose their interrelation.

The paper proceeds by first developing a semantic construct, then demonstrating how it both represents generalizations from the transitivity literature and can be used to model case assignment. Section 2 discusses the connection between participant semantics and case assignment and extends the work of Dowty (1991), decomposing notions such as *agent* into more primitive semantic properties. The resulting properties are organized hierarchically into a lattice, a move inspired by the work of Aissen (2003). Section 3 demonstrates how the predictions of the lattice accord with insights from the transitivity literature. Section 4 gives an account of core case systems while section 5 provides analyses of non-canonical uses of case, both treating arguments which bear oblique case as well as providing principled explanations of case alternations.

2 Participant Semantics

Despite the wide variety of functions a case system may encompass, the fundamental responsibility of case relates to marking grammatical relations. A long line of research has attempted to articulate the link between case, grammatical relations and semantic elements of argument realization, of which I will give an overview before developing a semantic construct to this end.

Most centrally, case is used at minimum to mark the core arguments of subject and object. The foundational status of marking the subject and object relations is made obvious by how case systems are classified by their alignment patterns, e.g. nominative/accusative or ergative/absolutive. The primacy of this function also can be seen in how inventories of case systems develop and are organized. Blake (2001), for instance, argues that case systems have an overwhelming tendency “to be built up in a certain sequence” (p. 155), which he describes through an implicational hierarchy in (3) established on the basis of a diverse sample of languages.

- (3) nom < acc/erg < gen < dat < loc < abl/inst < others

This hierarchy states that if a case system includes a particular case on the hierarchy, then the system’s inventory also usually includes a case from each position to the left of that case in the hierarchy. The hierarchy also implies that the cases used to encode the core arguments such as subject, object and indirect object are privileged, and more basic, in the organization of case systems.

As the connection between case assignment and core grammatical relations is so central, a theory of case must elucidate this connection most clearly. Further, if marking core arguments is central to case systems, then the search for which factors influence case assignment reduces to a search for which factors influence the selection of core arguments. In this direction, a large body of research has focused on grounding the selection of the core arguments subject and object in the semantics of a predicate’s argument structure, which states that the predicate requires certain types of participants as its subject, object, etc. For instance, the German verb *schlagen* ‘hit’ requires the subject to be an *agent* and the object to be a *patient*.

- (4) German

Er schlägt den Jungen
he.NOM hit.PRS.3SG ART.ACC boy.ACC

‘He hits the boy.’

(Kittilä, 2002, p. 51)

As case marks these core arguments, it follows that there is a link between case assignment and the semantic elements of argument realization, namely notions of participants such as *agent* and *patient*. Yet, directly associating case marking with various participant roles such as *agent*, *recipient*, *patient*, as in Fillmore (1968), despite their initial appeal, have proven unsatisfactory (see the critical discussion in Levin and Rappaport Hovav (2005)). In particular for case, discrete, unanalyzable participant roles such as *agent* have proven too coarse-grained to provide the flexibility needed to correspond with the actual distribution of case markers across languages.

The granularity of participant roles is an issue relevant not only for theories of case assignment, but for theories of argument realization at large. The notions of agency and affectedness have generally been taken to determine which participant is an *agent* or a *patient*, respectively, and ultimately, subject or object, of a transitive construction. Yet, using the concepts of *agent* and *patient* in themselves as primitives has had limited success in predicting which arguments of a two-place verb would be lexicalized as the subject. Dowty (1991) responds to this difficulty by decomposing the larger notions of *agent* and *patient* into constituent properties, whereupon *agent* and *patient* become emergent properties. His theory recasts the various proposed semantic roles, such as *agent*, *benefactive*, *patient*, *instrument*, etc., in terms of two overarching notions, Proto-Agent and Proto-Patient. Proto-Agent and Proto-Patient are defined as “cluster concepts” based on more fine-grained concepts that are (second order) event-based properties entailed by a predicate—for instance, the Proto-Agent property ‘causally affecting’ or the Proto-Patient property ‘undergoing a change of state’. In this framework, no one property defines agentivity; agentivity is arrived at through the accumulation of a sufficient number of the appropriate properties relative to the other arguments of the predicate. Using these more fine-grained properties also provides a way to account for more nuanced argument realization patterns.

The core of Dowty’s proposal is the set of proto-role properties displayed in table 1. The properties of independent existence are within parentheses since Dowty was uncertain about whether these properties were semantic properties relevant to argument selection or whether they rather contributed to discourse notions of subjecthood (p. 572). Based on these properties, Dowty defines an Argument Selection Principle: “In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the object” (p. 576). In general, this principle performs well, accounting for challenging instances of subject and object selection, e.g. for verbs of perception, where the argument with the property ‘sentience’—the experiencer—is realized as subject and the argument with no Proto-Agent entailments—the theme or stimulus—is realized as object.

Table 1 Proto-Role Properties from (Dowty, 1991, p. 572)

Proto-Agent	Proto-Patient
volitional involvement in the event	undergoes change of state
sentience (and/or perception)	incremental theme
causing an event or change of state in another participant	causally affected by another participant
movement (relative to the position of another participant)	stationary (relative to the position of another participant)
(exists independent of the event)	(does not exist independently of the event, or not at all)

Despite the advances made by Dowty’s proposal, attempts to broaden the system beyond the immediate concerns of the phenomena treated in Dowty (1991) reveal two primary shortcomings. First, as the names of the properties indicate, the proto-role system takes the transitive situation as given, as noted by (Davis, 2001, p. 64), (Davis and Koenig, 2000, p. 74) and (Primus, 1999, p. 47). Many of the proto-properties are defined in terms of two participants, e.g. causing an event or change of state in another participant, and therefore phenomena that differ from the typical transitive situation (e.g. middle voice or oblique objects, as discussed in (Davis, 2001, p. 65-66), (Davis and Koenig, 2000, p. 74-75)) are difficult to treat within this framework. Additionally, some of the properties themselves can be simplified: affectedness and causation are relatively complex notions, and by treating them as entailments, Dowty takes them as primitive. A binary distinction between affected and unaffected does not represent degrees of affectedness, viz. the distinction between partially affected and totally affected, as is often distinguished in typological studies (Comrie 1989, Hopper and Thompson 1980). Similarly, causation is a complex, composite notion implying at least two participants and a link between them. An increase in simplicity and empirical reach can be gained by decomposing these complex properties into simpler ones.

In the remainder of this section, I reformulate the system of Dowty. First, I develop properties which reconcile the issues just discussed and then bring out the structure implicit in the properties and their combinations. This system builds on several precedents, including Rozwadowska (1988), Testelec (1998), and Næss (2007), and particu-

larly the approach of Jakobson (1936), who developed a holistic structure representing the semantic contrasts emerging in case assignment.

2.1 Reformulating the Proto-Role Approach

I adopt the groundwork established by Dowty but revise his original categorization and nomenclature. Rather than have two independent, yet related sets of properties, I use one set of properties which correlates with a description of a Proto-Agent. It is then possible to define Proto-Patients in terms of privative opposition to these properties. Proto-Patients, then, are unspecified for Proto-Agent properties. Table 2 displays these agentive properties and the corresponding properties in privative opposition. The resulting features give two diametrically opposed classes, one class must be instantiated by existing, active, willful and moving entities, and another class that is not even entailed to exist. A set of informal definitions of these properties follows:

Table 2 Agentivity Properties in Privative Opposition

Agentive	Non-Agentive ('Patient')
+ volition	\emptyset volition
+ sentience	\emptyset sentience
+ instigation	\emptyset instigation
+ motion	\emptyset motion
+ existential persistence(beginning)	\emptyset existential persistence(beginning)
+ existential persistence(end)	\emptyset existential persistence(end)
+ qualitative persistence(beginning)	\emptyset qualitative persistence(beginning)
+ qualitative persistence(end)	\emptyset qualitative persistence(end)

Volition: *Volition* is entailed by a predicate if the participant necessarily intends to bring about the event designated by the predicate.

Sentience: *Sentience* is defined as “conscious involvement in the action or state”, following an early proposal by Rozwadowska (1988). Clearly, *sentience* is entailed by an argument of emotional and psychological predicates among others.

Rozwadowska (1988), and later Næss (2007), do not distinguish between the categories of *volition* and *sentience*. I follow Dowty in considering relevant the distinction between being cognizant of the event designated by the predicate and intentional behavior in the event. Including both *sentience* and *volition* distinguishes predicates which only entail that an argument be consciously involved in a passive manner, e.g. mental predicates such as *know* or *like*, from those which require intentional involvement, such as *agree* or *decide*. Further, this distinction between intentional and non-intentional action can be relevant for case marking, as example (1) demonstrated.

Instigation: *Instigation* is entailed for an argument if prior, independent action which effects the given event can be attributed to that argument. This includes the subjects of transitive change of state verbs such as *kill* or two-place *melt*. This property represents a departure from Dowty in that when *instigation* is entailed for an argument, it is only in relation to the event, not to any other argument, in contrast with the property ‘causing an event or change of state in another participant’. This definition builds on discussions in Cruse (1973), Kearns (2000), Næss (2007) and Schlesinger (1989).

Motion: *Motion* is entailed by a predicate just in case an argument is required to be in motion, which is most obviously the case with verbs of motion, such as *come*, *descend*, *go* or *move*, but also with verbs such as *carry* and *take*, or verbs of manner of motion such as *run* and *walk*.

Persistence: While ‘affectedness’ is a commonly used concept in the argument realization and transitivity literature, I employ the inverse notion of *persistence* here. An entity which is unchanged by the event or state can be said to persist, a notion borrowed from Aristotle (*On Generation and Corruption* I:4). Persistence throughout the event is tracked in two respects: something can persist *existentially*, whereby its essence remains the same in that it neither comes into or goes out of existence during the course of the event/state, or it can persist *qualitatively*, that is, none of its qualities undergo any change. *Qualitative persistence* covers any other change besides an existential one, including changes of quality, quantity or location. For instance, transitive *move* entails for an argument that it moves during the course of the event—while the entity designated by this argument does not change existentially, it does change in its location. Accordingly, transitive *move* entails for this argument *existential persistence*, but not *qualitative persistence*. In contrast, the predicate *see* does not entail any change of persistence for the argument which is seen, which implies that the predicate entails both *existential persistence* and *qualitative persistence* for this argument.

The definition of *persistence* marks another departure from Dowty (1991). While Dowty only tentatively included “existence” as one of the proto-role properties, it is here treated as a full proto-role property. Further, recasting affectedness in terms of existential and qualitative persistence yields a three-way, rather than binary, distinction concerning objects affected during the course of an event: no change, qualitative change and existential (and therefore total) change.

I further distinguish *persistence* according to whether it is entailed at the beginning or end of the event. For example, verbs of creation entail for an argument that an entity shifts from non-existence to existence. For example, *build* will only entail that its object is +*existential persistence (end)*, but not that it persist at the beginning of the event. In contrast, *destroy* would only entail its object to be +*existential persistence (beginning)* but not that it persist at the end of the event.

The different notions of *persistence* reproduce the effect of Dowty’s “causally affected by another participant” and “undergoes change of state”. If, under Dowty’s system, the argument of a predicate would be entailed to undergo a change of state, then, within the system here, the predicate does not entail +*qualitative persistence (end)* for that argument. The notion of “affectedness” is inverted in a way consistent with of the system of privative opposition—the Proto-Patient property of being affected is defined here as underspecified with respect to an agentivity property, *persistence*.

Other relations present in the system of Dowty (1991) emerge in the system proposed here. For instance, causality can be expressed in terms of a relation between arguments which entail *instigation* and those which do not entail *persistence (end)*, whether qualitative or existential. Therefore, the system of the proposed primitives is able to express the same relations and achieve the same results as Dowty (1991), while also expressing a more fine-grained distinction between different types of affectedness and, as any reference to relations between participants has been dispensed with, these properties are applicable to intransitive as well as transitive predicates.

2.2 The Agentivity Lattice

Having developed the system of primitives, I now impose additional structure on it by constructing a lattice that takes the primitives as atoms. This structure arises simply from the logical relations among the primitives and their combinations.

2.2.1 The Construction of the Agentivity Lattice

The agentivity properties, i.e. the positive properties from table 2, can be regarded as atoms from which “proto-roles” are composed. Predicates may entail multiple properties for an argument, and it is therefore useful to represent combinations of properties—for instance, a composite notion of *motion* and *instigation* would be instantiated by entities which satisfied both *motion* and *instigation*, which I will designate symbolically by $motion \wedge instigation$. Given this set of atomic properties and their possible combinations, an order in terms of inclusion can be established—thus both *motion* and *instigation* are included in the composite term $motion \wedge instigation$, in symbols: $motion \subseteq motion \wedge instigation$ and $instigation \subseteq motion \wedge instigation$. This set of atomic elements, ordered by inclusion (i.e. a partial order), ultimately yields a mathematical structure, a lattice. (A partially ordered set is a lattice if every finite subset has a least upper bound and a greatest lower bound.) This lattice then provides a structure upon which the semantics of participants required by predicates can be mapped. In essence, a given predicate will entail certain properties, and the participant types that are consistent with these properties can be shown as connected sub-spaces of the general space of the lattice.

The lattice represents the total combinations of the properties; given that the structure is rather complex, and to make the overall structure more perspicuous, I will construct the lattice in two steps. I will first focus on the lattice defined by the properties *volition*, *sentience*, *motion* and *instigation*, and then the lattice defined by the four persistence properties, the two different sets of properties representing those most relevant to agents and patients, respectively. At the end of the section, I will combine the two lattices. Alternately, the structure I present could be defined directly from the total set of properties.

The possible combinations of the first set of properties are constrained by relations holding among the different properties, namely *volition* clearly entails *sentience*. In practical terms, this means that whenever *volition* is entailed, *sentience* is also entailed. A lattice which hierarchically organizes the possible combinations of the atomic elements *motion*, *instigation*, *sentience* and *volition* is given in figure 1.

By examining some predicates associated with the different nodes of the lattice, an intuition can be developed for how this structure delineates relations holding among the arguments of different predicates in terms of degrees of agentivity. For the moment, I disregard changes in *persistence* and select some examples which populate different nodes of the lattice in figure 1. The lowest node will include subjects of positional verbs such as *sit* or *stand*. The node with only the property *sentience* will include subjects of verbs such as *know* or *see*. The node with both *sentience* and *instigation* will include the subject of *discover*. The node with *sentience*, *instigation* and *motion* will include the subject of *look at*. Finally, the node with *sentience*, *instigation*, *motion* and *volition* will include the subject of *assassinate*. The examples indicate that the higher (lower) an argument’s position on the lattice, the greater (lesser) degree of agentivity of that argument.

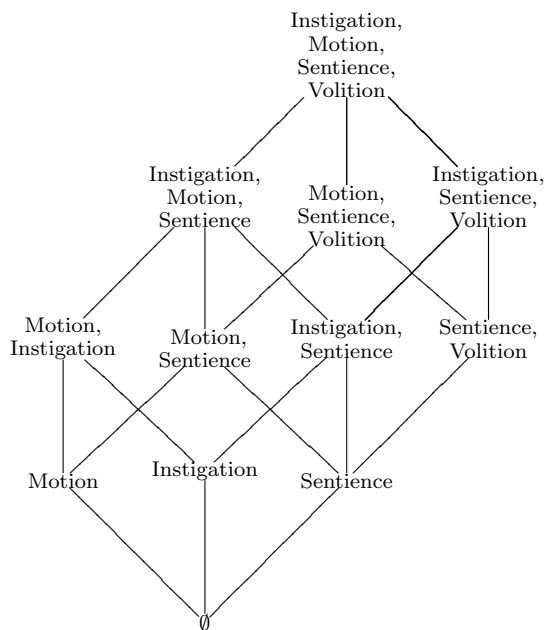


Fig. 1 Agitivity Properties Organized via a Lattice

For the second set of properties, the four types of *persistence*, a similar ordering can be imposed. The subcategories of *persistence*, differentiated by *beginning/end* and *existential/qualitative*, yield many logically impossible combinations that constrain the possible number of combinations of features. There are two main principles of exclusion at work. If an entity exists, it does so with a certain amount of qualities, and thus some degree of qualitative persistence always accompanies existential persistence. Second, if an entity does not exist at the beginning and/or end of an event, its qualities will not exist at the beginning and/or end of the event either, and similarly for when an entity does not exist both at the beginning and at the end of an event. I give the remaining five possible combinations below, in which I use the following abbreviations for the different types of persistence: *existential persistence (beginning)*=ExPB, *existential persistence (end)*= ExPE, *qualitative persistence (beginning)* = QuPB, and *qualitative persistence (end)* = QuPE.

Total Persistence (+ExPB, +ExPE, +QuPB, +QuPE): The entity persists existentially and qualitatively at the beginning and end of the event. This typically holds for prototypical transitive subjects, where the subject is unaffected by the action, as well as for intransitive subjects of verbs such as the positionals *sit* or *stand*. Objects, can be unaffected as well, for instance, those of perception and psychological verbs or those involved in the conative alternation, e.g. *cut at* where the object is not necessarily affected.

Qualitative Persistence (Beginning) (+ExPB, +ExPE, +QuPB, ∅QuPE): The entity exists before and after the event but has undergone a qualitative change. This regularly corresponds to patient arguments, such as the objects of transitive *move*,

dim or *widen* which undergo a change, or the intransitive subject of *fall*, or sentient arguments which undergo a psychological change, such as the object of *frighten*.

Existential Persistence (Beginning) (+ExPB, \emptyset ExPE, +QuPB, \emptyset QuPE): The entity exists prior to the event's happening, but ceases to after the event, as in verbs of destruction (*ruin*, *destroy*) or intransitive subjects of predicates such as *die* or *evaporate*.

Existential Persistence (End) (\emptyset ExPB, +ExPE, \emptyset QuPB, +QuPE): The entity does not exist at the beginning of the event but does at the end, found with verbs of creation such as *build* or *invent*, or the intransitive subject of *appear*. Although the distinction between verbs of creation and destruction is not distinguished in Dowty's proto-properties, as both are conflated in *dependent existence*, the argument realization literature notes a demonstrable asymmetry between objects of typical transitive verbs and those verbs of creation, as shown in the pseudo-cleft constructions in (5).

- (5) a. What John did to the table was ruin it.
 b. *What John did to the table was build it. (Fillmore 1968:4)

Pseudo-cleft constructions are commonly assumed to have a presupposition regarding the focused element, here that John did something to the table (Ramsay 1992). As the object of *build* in (5b) does not exist prior to the activity denoted by the predicate, it conflicts with the presupposition, wherein the table was presumably already acted upon and, accordingly, existent. Verbs of creation and such effects are further discussed in von Stechow (1999) and Piñon (2007).

Total Non-Persistence (\emptyset ExPB, \emptyset ExPE, \emptyset QuPB, \emptyset QuPE): The entity does not persist existentially either at the beginning or the end of the event. This category is relevant both to statements of non-existence, such as arguments of negated copulas, and intensional predicates, such as *seek*, that do not entail existence for one of their arguments.

These five combinations can then be ordered by inclusion as well, again with the positively marked persistence properties as atomic elements. This inclusion ordering establishes an ordering of degrees of persistence: if one set, e.g. *total persistence* includes a second set, then the first set has a greater degree of persistence, and conversely for the relation of being included. Accordingly, *total non-persistence* is vacuously included in every other combination since it does not have any positively marked members. *Existential persistence (end)* is included in *total persistence*. Finally, *existential persistence (beginning)* is included in *qualitative persistence (beginning)* which is in turn included in *total persistence*. These last two patterns of inclusion are schematically represented in (6) and (7), respectively. These features can then be hierarchically organized in a lattice, displayed in figure 2.

$$(6) (\emptyset\text{ExPB}, +\text{ExPE}, \emptyset\text{QuPB}, +\text{QuPE}) \subseteq (+\text{ExPB}, +\text{ExPE}, +\text{QuPB}, +\text{QuPE})$$

$$(7) (+\text{ExPB}, \emptyset\text{ExPE}, +\text{QuPB}, \emptyset\text{QuPE}) \subseteq (+\text{ExPB}, +\text{ExPE}, +\text{QuPB}, \emptyset\text{QuPE}) \subseteq (+\text{ExPB}, +\text{ExPE}, +\text{QuPB}, +\text{QuPE})$$

We now have two structures that organize the sets of properties resulting from the reformulation of Dowty's proto-properties. One advantage of working with lattices is that it is simple to combine them by taking their Cartesian product. The Cartesian product of the two lattices is the set of all pairs of elements from each lattice with their componentwise relations, inherited from the original lattices. Informally, it is a matter

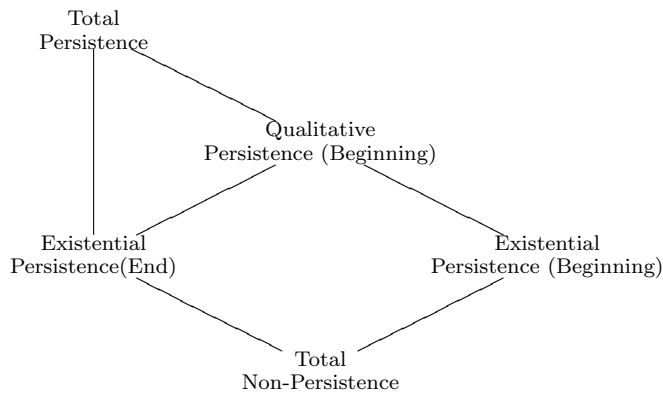


Fig. 2 Persistence properties organized via a lattice

of inserting at each node of the persistence lattice the entirety of the lattice of figure 1 and then establishing the connections between all the nodes by inclusion².

The resulting structure is additionally constrained by the conceptual impossibility of predicates entailing agentivity properties such as *motion* or *sentience* but not the feature *existential persistence (beginning)*. If a predicate does not even entail initial existence for an argument, it will not entail properties such as *instigation* and *motion* for that argument either; accordingly, the nodes of *total non-persistence* and *existential persistence (end)* do not support combining with any other properties.

Having excluded all the logically and conceptually impossible combinations, the product is as displayed in figure 3. The resulting product is again a lattice, and I will refer to this larger lattice as the agentivity lattice. Each node of the lattice determines one type of participant defined by the properties of that node. All the nodes of the *existential persistence (beginning)* branch of the lattice are related by inclusion to those of the *qualitative persistence (beginning)* branch, which are in turn included in those of the *total persistence* branch. (The lines designating all the inclusion relations between the nodes of the different branches of the lattice have been excluded for purposes of legibility.)

2.3 Properties of the Agentivity Lattice

The agentivity lattice is a theory of argument realization, describing the possible space of argument realization with respect to the agentivity properties taken as primitive. This structure articulates the relations holding between different participant types and possesses some attractive properties. First, as one ascends in the lattice structure, the higher the degree of agentivity. Further, since any node of the lattice can be related to any other node, this structure yields a metric of semantic prominence in terms of agentivity properties. By the same token, one can define topological notions such as proximity or closeness between participant types in terms of proximity within the lattice, which can be interpreted as semantic similarity among participant types. Conversely,

² The properties could also be combined by inserting at each node of the lattice of figure 1 the entirety of the persistence lattice. While the mathematical relations would be identical, the graphical representation would be more cumbersome for what is to follow.

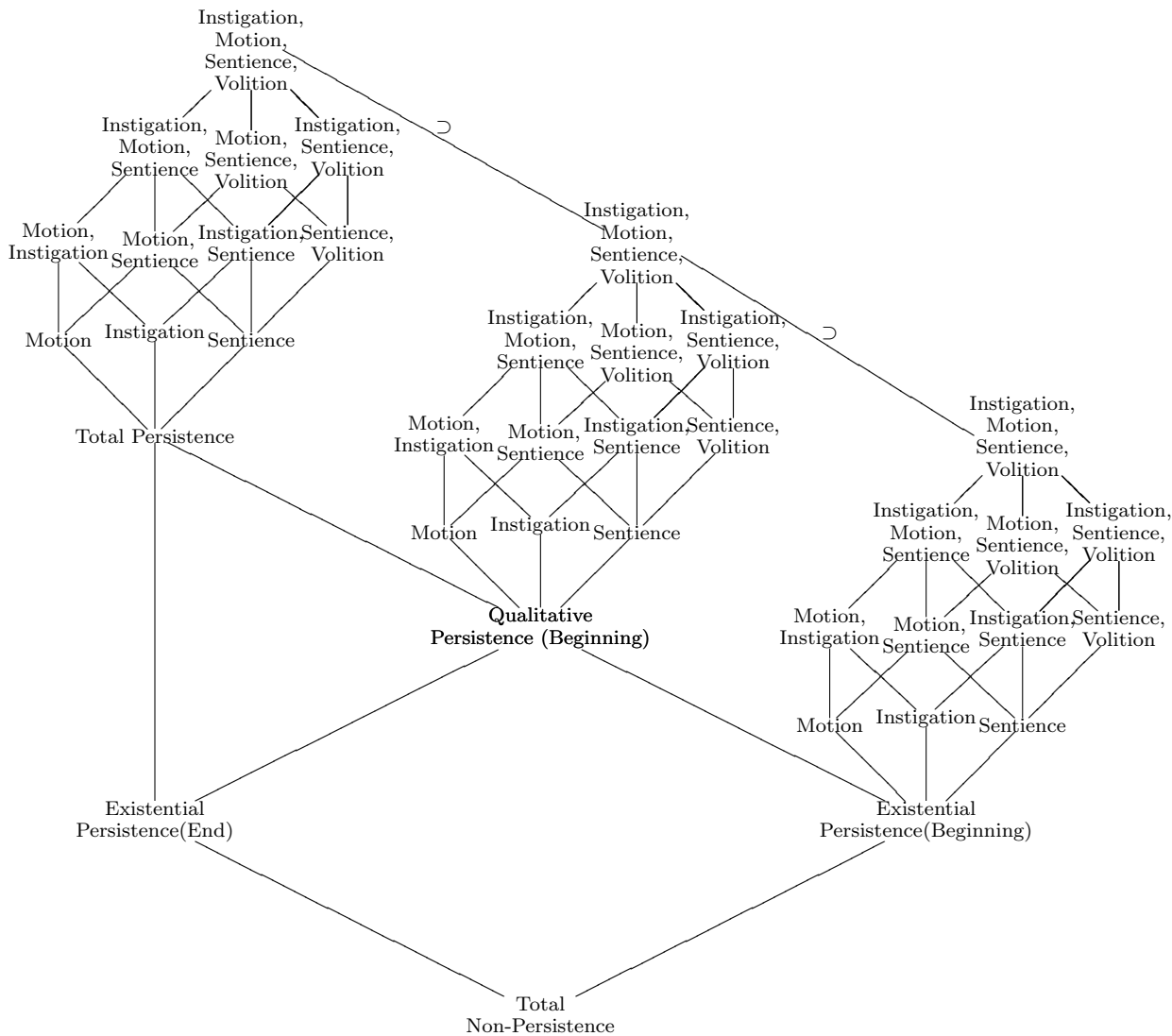


Fig. 3 The Agentivity Lattice

greater distance between nodes standing for participant types can be interpreted as greater dissimilarity.

The structural relations presented in the lattice lead to a simple implementation of subject selection. Subject selection, at least for accusative aligned languages, is accomplished by selecting the argument which has the greater number of entailments, or equivalently, the dominant or higher position in the lattice structure. For a two-place predicate, if the entailments for argument *A* of a predicate corresponds to a node of the lattice which dominates those of argument *B*, then argument *A* is selected as subject. This contrasts with the argument selection principle of Dowty (1991), wherein

one must evaluate two sets of Proto-Agent and Proto-Patient properties with respect to the two arguments.

This structure, with its capacity to represent a connected set of participant types, also makes perspicuous the range of participants which satisfy the entailments for an argument of a predicate. For instance, agents involved in the event designated by *kill* only need to entail *instigation*, but not *sentience* or *volition*—natural forces such as *electricity* or eventive nominals such as *the explosion* serve as acceptable subjects for *kill*. Yet, properties such as *sentience* or *volition* are consistent with subjects of the predicate, and accordingly entities instantiating nodes of the lattice with combinations of *instigation*, *sentience* and *volition* will also be acceptable subjects for *kill*. More generally, any argument which is located in the connected region upwards of the minimal entailments for the agent argument of *kill* is predicted to be an acceptable subject of that verb. This accords with the insight of Van Valin and Wilkins (1996), who note that predicates such as *kill* often permit a range of subjects from inanimate actors to intentional agents.

The range of an argument is of course delimited by contradictions of entailments. For instance, the patient argument of the contact verb *hit*, which entails *qualitative persistence (beginning)*, can be satisfied by various configurations of features. Canonically, the argument is instantiated by entities which instantiate the entailments of the node *qualitative persistence (beginning)*, i.e. where there is some change in the object. Yet, the argument can also be satisfied by entities instantiating the entailments of the node *total persistence*, where there is no necessary change, as in the conative alternation variant *hit at*. Alternately, although *hit* does not encode the same reading as *destroy*, it is consistent with a description of an event where the entity happens to be destroyed at the end of the event, and so the argument of *hit* could even be satisfied by entities instantiating the entailments of the *existential persistence (beginning)* node. Yet, the patient argument of *hit* will not be satisfied by arguments which do not satisfy *existential persistence (beginning)* as the verb entails that an entity exists at the beginning of the event.

The degree of agentivity within these argument ranges can be characterized more formally in terms of closure properties, where agents are upwards closed in the lattice while patients are downward closed. In essence, if some node x of the agentivity lattice qualifies as an agent relative to a given predicate, then all the nodes higher than x qualify as well. Conversely, if some node y of the agentivity lattice qualifies as a patient relative to a predicate, then so do the nodes lower than y . (More formally defined, a subset U of a partially ordered set is upwards closed if x in U and $x \leq y$ implies that y belongs to U , and conversely, U is downwards closed if $x \geq y$ implies that y belongs to U .) This property of the agentivity lattice guarantees that if the agent (patient) argument of a predicate is satisfied when instantiated by an entity of a given level of agency, it will also be satisfied when instantiated by an entity possessing a higher (lower) level of agency.

The lattice just constructed has some clear similarities with semantic maps (Haspelmath 2003). Both provide a “conceptual/semantic space” of connected elements upon which topological notions such as “closeness” can be defined; however, the constituent elements and orientation of the structures differ substantially. Semantic maps are built upon functions of grammatical markers—in the treatment of the dative in (Haspelmath 2003), functions such as *recipient* or *beneficiary* are constituents for the semantic map of the dative. The agentivity lattice is built upon semantic properties which, in turn, presumably support different functions. Second, semantic maps are typically built up

inductively via cross-linguistic comparison, for instance, comparing the different functions associated with the dative across languages. The lattice constructed here is arrived at deductively from the relations holding between the semantic primitives. Ultimately, both approaches compliment each other: semantic maps provide a rich resource for testing the predictions of the lattice while the lattice strives to provide a semantic explanation for why two functions of a case would be contiguous on a semantic map.

Before using this theory to treat case, I turn to describing how this theory relates to the notion of transitivity, which touches on both the semantic foundations of argument realization and case marking patterns.

3 Generating the Transitive Region

Research in syntactic typology has isolated a semantically unmarked type of two-place verb that systematically occurs across languages in core case marking patterns, e.g. nominative/accusative or ergative/absolutive. In essence, core case marking appears with a privileged type of event, typically a causal action resulting in a change of state in the affected participant, with canonical examples being of the type *X killed/broke Y*. Conversely, verbs which designate events that deviate from this type of action tend to appear with oblique case marking. Hopper and Thompson (1980) names these semantically unmarked core situation types as *transitive*, loosely defined as “a carrying-over or transferring an action from one participant to another” (p. 253). Næss (2007) further adds that prototypical transitive clauses are those in which the two participants stand in maximal semantic distinction with respect to their roles in the event designated by the predicate (see also Primus 1999, p. 59). Within the context of the structure defined in the last section, the transitive situation, based on the opposition in the semantics of participants, corresponds to a privileged semantic opposition present in the lattice of agentivity.

The canonical transitive situation minimally involves an agent performing an action and an object which undergoes the effects of that action. Arguments associated with the two nodes of *existential persistence (end)* and *total non-persistence* violate the second condition, since any such argument would not exist at the beginning of the event as would be necessary to undergo the effects of the action. Excluding those two nodes results in a symmetrical lattice that encodes the typical transitive situation, which I will refer to as the *transitivity region*, shown in figure 4.

The vertical axis of the transitive region encodes the degree of agentive involvement in the event, while the horizontal axis encodes the degree of affectedness in terms of change in persistence. The upper-left-hand corner contains all the positive entailments, and the lower-right-hand corner is free from entailments, save initial existence. Thus, maximal agents, those with the most entailments, and maximal patients, those with the fewest entailments, are diametrically opposed within this region.

This framework encapsulates some of the primary generalizations of typological work on argument structure and transitivity. First, the position of maximal agents and maximal patients in the lattice are in maximal semantic opposition with respect to the agentivity properties. This aligns with Næss’ observation that prototypical transitive clauses exhibit a “maximal semantic distinction of arguments”.

A second attractive by-product of the framework is its ability to characterize what Hopper and Thompson (1980) names “increases” and “decreases” in transitivity. Clauses which are higher in transitivity are semantically more similar to the canonical

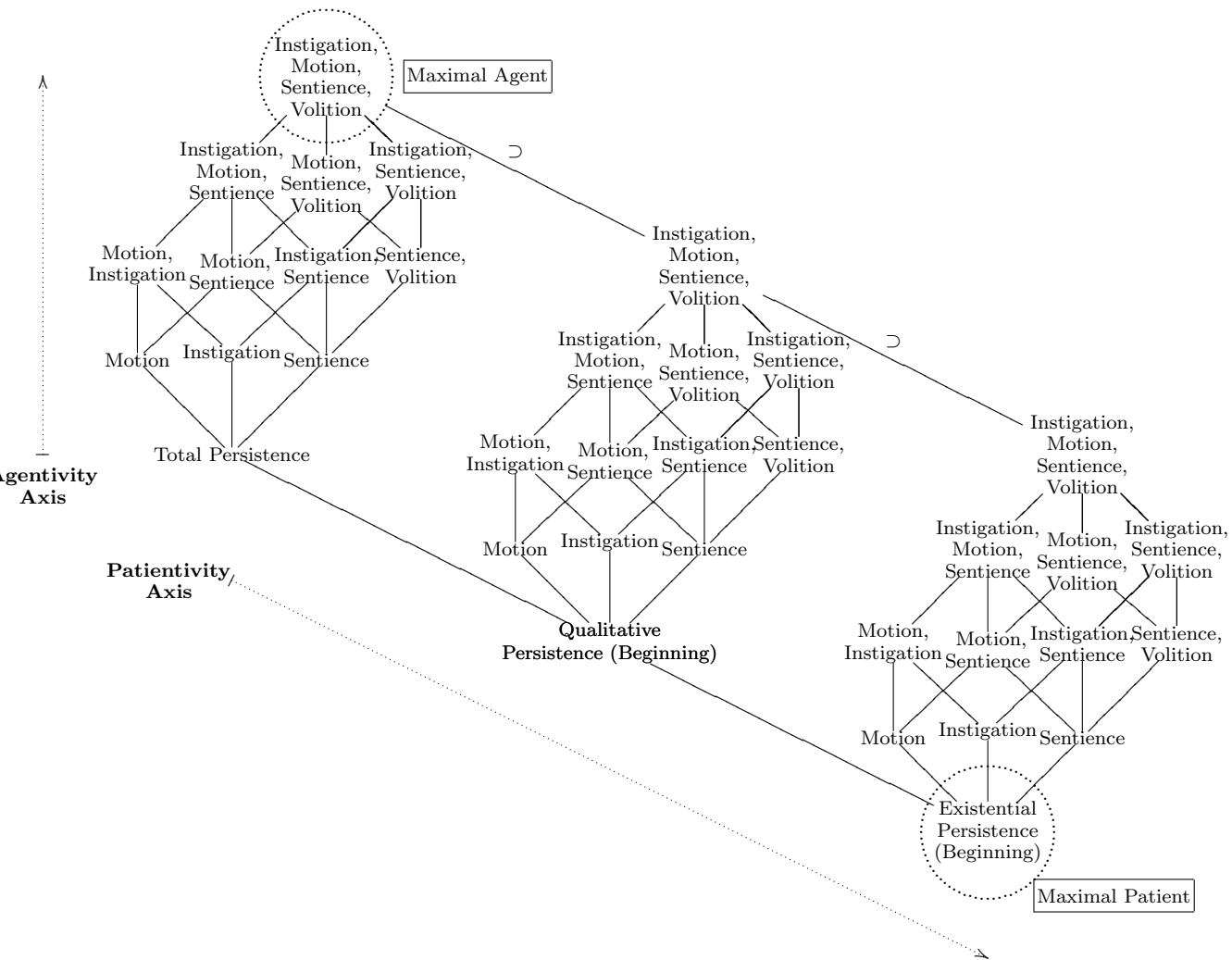


Fig. 4 Transitivity Region

transitive situation while clauses which are lower in transitivity are less similar to the canonical transitive situation. In the transitive region, pairs of arguments which are located closer to the opposing poles of maximal agent and patient are closer to the canonical transitive situation. As both arguments increase in their proximity to the maximal positions, so increases the event type's level of transitivity, and conversely for decreases in transitivity. This can be demonstrated by examining the hierarchy in (8) from Malchukov (2005) that displays the relation between a set of verb classes (labeled I, II and III) and their levels of transitivity.

- (8) Resultative Effective Action (I) >> Contact (II) >> Pursuit (III)
 (kill, break) (shoot, hit) (search)

This hierarchy states that if a verb in a class lower in the hierarchy is able to take the canonical marking of transitive verbs, then the verbs in the classes higher in the hierarchy will be able to as well. Malchukov (2005) notes that the hierarchy in (8), covering a subset of the verbs from the hierarchy of Tsunoda (1985), displays decreased patientivity with respect to objects: the further to the right the verb stands in the hierarchy, the less affected that verb's object is. Resultative Effective Action verbs, such as *break* and *kill*, are the paradigmatic class of the transitive verb, where the object is completely affected, in contrast to Contact verbs (*shoot*) where the object is not entailed to be totally affected. Pursuit verbs (*search*), typically have objects which are not at all affected. The lattice embodies this generalization: once the entailments for arguments of these verb classes are represented on the lattice, the hierarchy emerges from the order in which the verb types show a progression away from the maximally distinct positions of the transitive region, as I will exhibit with mappings of the entailments of canonical examples from each class.

I take *break* as a representative example of two-place Resultative Effective Action verbs. The agentive argument of *break* canonically entails *instigation* and *motion*, as the agent argument normally effects some independent action which includes motion. This argument is labeled **Ia** in figure 5, where the roman number gives the verb class in the hierarchy and **a** is mnemonic for the “agent” argument. The patient argument of the core Resultative Effective Action verbs does not entail that the argument persists existentially through the event—in the case of *break*, the object is broken during the course of the event. The patient argument maps to the node *existential persistence (beginning)*, labeled **Ip** in the figure, where **p** stands for “patient”. The arguments of *break* are then both defined within the transitive region and opposed on different positions of the lattice within that region.

Contact verbs (*shoot*) locate their agent arguments (**Ia**) in the same node as Resultative Effective Action verbs but differ in that the patient argument of Contact verbs (**Iip**) has a higher level of *persistence*. The patient argument canonically persists existentially throughout the event and only changes qualitatively, accordingly located on the *qualitative persistence (beginning)* branch of the lattice. The arguments of *shoot* are then both defined within the transitive region yet less distanced from one another on the lattice relative to Resultative Effective Action verbs.

Pursuit verbs such as *search* do not require that the entity searched for exists. Pursuit verbs then deviate more strongly from the prototypical transitive paradigm than Contact verbs in that the patient is not even guaranteed to exist, let alone be affected or undergo a change. These verbs, like Contact verbs, also differ from Resultative Effective Action verbs in terms of *persistence*, but, in contrast to Contact verbs, Pursuit verbs locate the patient argument (**IIIp**) on the node of *Total Non-Persistence*, which falls outside of the transitive region. The opposition of the arguments of *search* are not defined within the transitive region, and accordingly deviate more strongly from the transitive paradigm than Contact verbs, producing the ordering of deviation in the hierarchy. Having shown the lattice's capacity for embodying typological generalizations about the realization of case by way of transitivity, I now turn to treating the core case systems themselves.

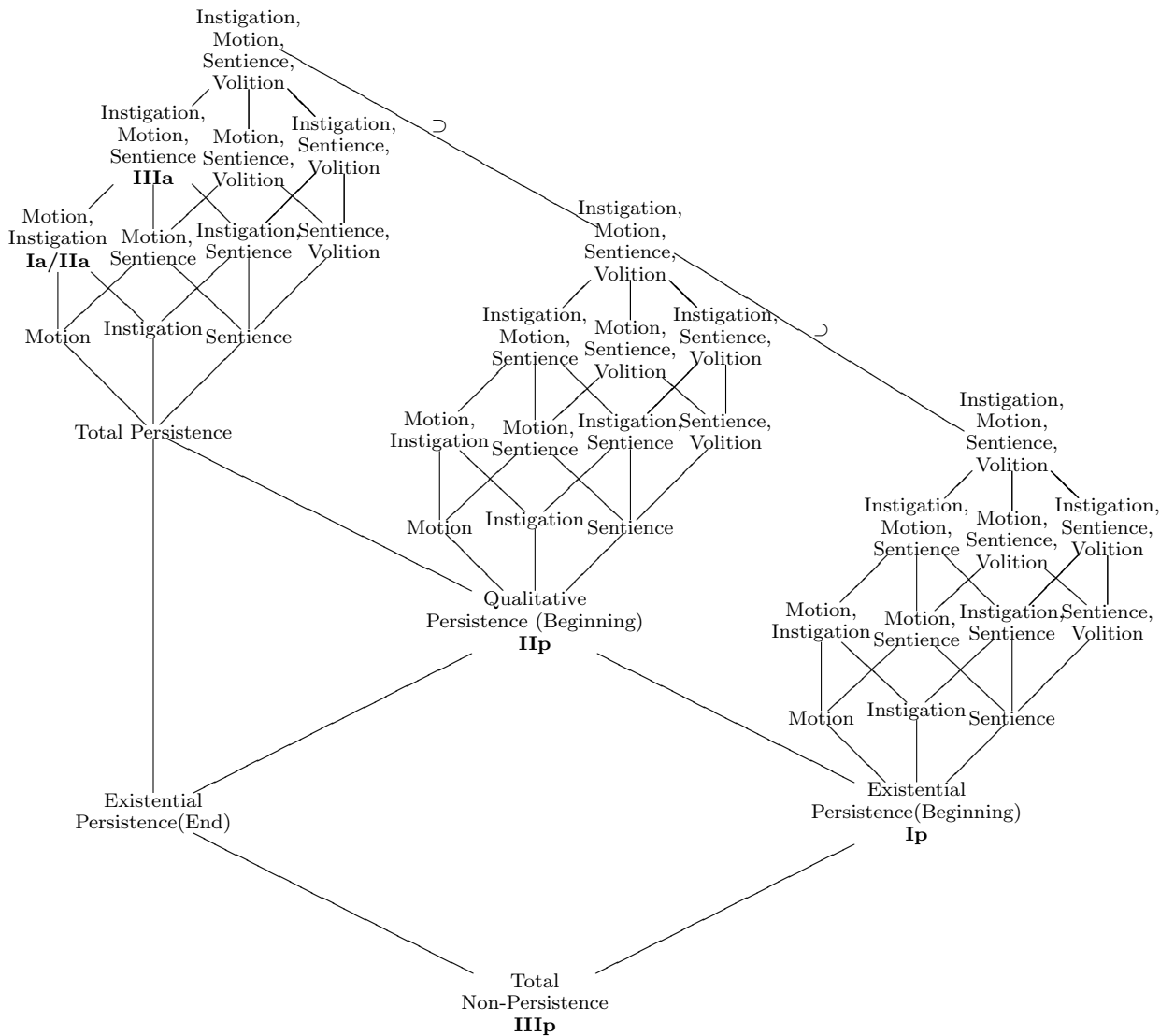


Fig. 5 Mapping of Tsunoda's Effectiveness Condition

4 Case as a Connected Semantic Region: Core Case Marking Systems

Core case marking systems are responsible for marking subjects and objects in a clause. As discussed in section 2, a substantive link holds between case assignment and the semantics of agentivity: since subjects and objects are associated with agentivity properties, it follows that a case used to mark subjects or objects will also be associated with the same agentivity properties, which can then be represented as a region of the agentivity lattice. As the transitivity literature indicates that core case markers are intimately linked with maximal agents and maximal patients, the region of a core case marker will minimally include the maximal agent or the maximal patient node. In

general, the maximal agents and the maximal patients are the most cross-linguistically predictable regions. If a language possesses a case marking system, these areas will be marked by the core syntactic cases, e.g., accusative or ergative. The regions of the core case markers spread outwards from the maximal node in question, although languages vary as to exactly the size of the region designated by, for example, the ergative—as one increases in distance from the maximal agent, the lattice predicts more variation as to which nodes are included in the region of the ergative in a particular language.

This conception of case readily accounts for core case marking systems, at least in a generalized picture. Nominative/accusative marking systems align the agent with the subject (and therefore the nominative) and the patient with the non-subject position (and therefore the accusative). The core patientive region is morphologically marked, while the core agent region receives the default case marking (nominative). Syntactically ergative/absolutive systems show the inverse pattern of marking—the subject is aligned with the patient, both of which receive default case marking (absolutive), while the non-subject position is aligned with agent, which is morphologically marked. Both systems can be represented schematically by the lattice in figure 6, wherein the typical markings associated with two-argument transitive clauses are displayed.

The middle region of the lattice hosts the semantic correlates of oblique case marking. Most commonly, if the case marking of the construction differs from the standard core case markers, the argument will be located in this less stable region between the two opposing corners of maximal agent and patient.

Modeling the cases beyond core case markers follows the same pattern: the region of a case can be established by determining the semantic properties associated with that case's canonical use for marking a grammatical relation. For instance, if a case marks indirect objects of ditransitive verbs, arguments which are standardly considered recipients (Haspelmath 2005), then the case marker is associated with the semantic properties of recipients.

This view of case marking has several implications. First, the general semantic content of a case can be specified with respect to a region of the lattice. As opposed to approaches which resort to listing the properties and qualities of subjects (objects), the region of the lattice gives a structured set of properties, which are couched in a context of opposition to other properties.

Second, this approach accommodates two prominent views about the function of core case marking: the indexical view and the discriminatory view, an ambition shared by Næss (2007). The indexical view holds that case serves to mark specific semantic notions. As a case is represented as a delimited region of the agentivity lattice, it will specify the set of semantic properties associated with that case, satisfying the indexical view. The discriminatory view holds that case marking serves to distinguish an argument from the others in the clause, citing the phenomena of Differential Object Marking (DOM) as a case in point. When arguments of a transitive predicate are not readily distinguishable, due to either their semantic properties or their referential properties, then case marking may alleviate potential confusion (see Aissen (2003) and references therein for work on DOM as well as Arkadiev (2009) for a critical discussion of various views). As the lattice displays the semantic similarity of argument types, as discussed in section 2.3, this capacity can be leveraged to determine the semantic distinguishability of arguments. In this way, the lattice provides a method for gauging the opposition between properties of subjects and objects for a given predicate, determining which pairs of arguments will be semantically contrastive and to what degree, which in turn determines the use of case in the discriminatory view.

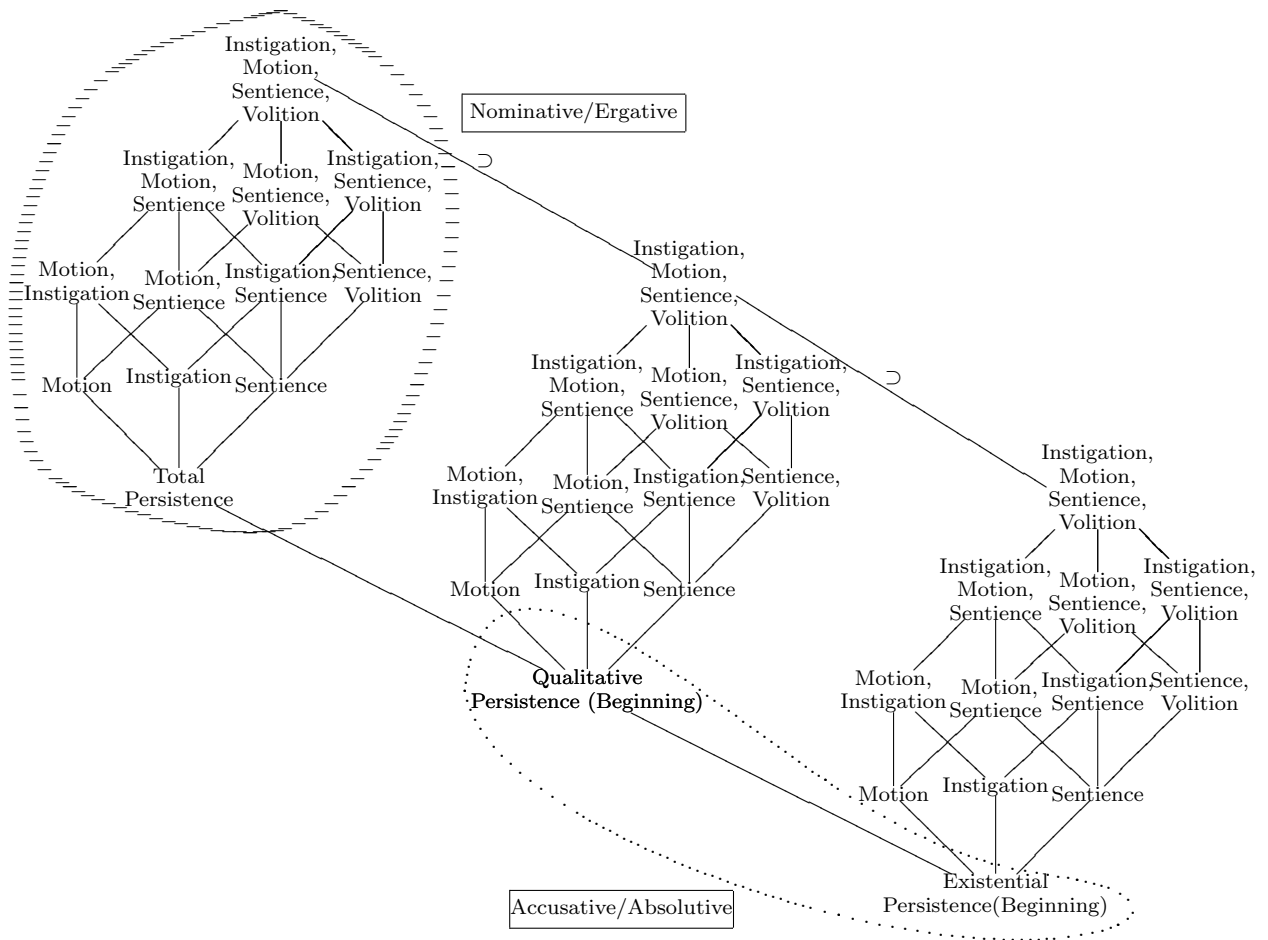


Fig. 6 Schematic Representation of Accusative and Ergative Systems

Discriminatory case marking is often thought of as triggered by referential properties, such as animacy and definiteness, which are the most cited attributes in analyses of DOM. Yet, as case marking in this model is based in argument realization properties, one expects that verbal properties may well also have an effect, and accordingly it is a combination of verbal and nominal properties which trigger DOM. These implications are supported by results due to von Heusinger (2008) from a corpus-based examination of the diachronic development of DOM in Spanish. His study indicates that the regularity of occurrence of DOM is conditioned upon different verb classes, e.g. *matar* 'kill', *ver* 'see' and *poner* 'put' have different rates at which DOM became regularized. The influence of predicates on DOM has also been noted in grammars of individual languages, such as the Persian grammar of Mahootian (1997): the Persian accusative marker *-râ* is normally triggered by definite NPs, but certain predicates such as *dombal-e gæštæn* 'look for' simply do not co-occur with accusative marked objects no matter their degree of definiteness. Given such findings, it is plausible that analyses of DOM must take both verbal and referential properties into account. As will

be shown in section 5.2 for definiteness, the verbal properties represented in the lattice can interact with nominal properties such as animacy and definiteness. Grimm (2005) uses this interaction to provide a treatment of the referential properties of DOM in the context of the agentivity lattice, demonstrating how referential properties play out within the context of the semantics of argument realization. The interaction between verbal and referential properties is not unique to DOM, but occurs across a variety of constructions, e.g. in case alternations, see section 5.2, as well as in the ‘instrumental subject’ construction, as shown in Grimm (2007) which applies the same framework developed here. Having discussed the application of the lattice of agentivity to core case marking, I now illustrate how the lattice applies to instances of case marking which differ from the core case marking pattern.

5 Non-Canonical Case Assignment

The theory developed so far has invoked three types of spaces defined over the agentivity lattice: the total semantic space given by the lattice for the semantics of argument realization, subspaces (connected regions) associated with prototypical uses of case markers and the subspaces generated by entailments of particular predicates. In a given case language, the case markers of the language will occupy distinct regions of the total semantic space of the agentivity lattice. Case assignment can be thought of as determined by how the space generated by entailments of a particular predicate is covered by the regions of different cases.

I have made an initial assumption that the region of a case coincides with its canonical use defined in terms of grammatical function. Accordingly, the space generated by, for instance, the second argument of prototypical members of the class of transitive predicates aligns with accusative (or absolutive) case following from this assumption; however, the theoretically more interesting occurrences are those of non-prototypical transitive predicates which manifest “non-canonical” case, where the case appearing on an argument is not the canonical case used to mark that argument’s grammatical function.

When considering predicates which are not prototypical transitive predicates, two possibilities arise. First, the space generated by the predicate for a given argument may coincide with a region of the lattice which is inhabited by a case. In this instance, that argument is able to be marked by that case, even if that case differs from the case normally used to mark the grammatical function in question, such as direct object. Section 5.1 discusses instances when the case prototypically used to mark indirect objects, the dative, is employed to mark certain types of subjects and objects whose participant semantics coincide with the participant semantics of the dative’s primary grammatical function. This view provides for the possibility of case polysemy—a single case may be employed in multiple ways, both syntactic and semantic, yet these uses will be related on the more abstract level of participant semantics. The second possibility occurs when the entailments for a predicate delimit a space which is covered by the regions of two (or more) cases, whereupon using different cases to mark the argument becomes an option. In this instance, the subspace delimited by the predicate’s entailments is partitioned by the different cases which stand in opposition to one another based on their constituent semantic properties. The use of one case instead of another signals a semantic contrast based on this opposition.

This section contains applications of the lattice demonstrating both possibilities. First, I examine commonly extended uses of the dative, both as subjects and second arguments of two-place predicates and second, I provide a treatment of the accusative/genitive alternation in Russian where semantic contrasts arise from the interaction between the lattice of agentivity and the parameter of definiteness.

5.1 Extensions of the Dative

The dative case is largely associated with the grammatical function of indirect object in ditransitive verbs, where ditransitive verbs are taken to be those three-place verbs including a theme-like argument and a recipient-like argument (Haspelmath 2005). Yet, cross-linguistically the dative case also frequently surfaces as a marker of an argument in a number of two-place verbs, either as a subject or the second argument, in these instances clearly not functioning as a marker the ditransitive recipient. Such constructions, aside from presenting obstacles to the view that there is a one-to-one mapping between grammatical function and case, beg the question why in particular the dative is used rather than some other case.

I first consider the agentivity properties associated with the canonical use of the dative to mark a recipient, as shown in (9).

(9) German

Franz hat seinem Freund ein Buch gegeben.
 Franz AUX his:DAT.SG friend ART.INDEF:ACC.SG book give.PTCP

Franz gave his friend a book.

Since ditransitive verbs such as *give* implicate “caused possession” for the recipient argument (Rappaport Hovav and Levin 2008), a canonical recipient will clearly be ‘consciously involved’ in the event, inasmuch as it is a possessor, and will be qualitatively affected by the event, as the possessions of the recipient have changed. Accordingly, the entity marked by the dative will be ascribed the properties of *sentience* and be located on the *qualitative persistence (beginning)* branch of the lattice, as in figure 7.

I now turn to two frequent cross-linguistic extensions of the dative, as a marker of experiencers and of the second argument of certain two-place predicates. Both uses of the dative can be related to the canonical use as a marker of recipients in that the same participant properties are required across the different predicates.

5.1.1 Dative Experiencers

The employment of the case of the indirect object to additionally mark experiencers is reasonably frequent (see Bossong (2006) for a discussion of the distribution across European languages). These experiencers often appear in subject position. Cross-linguistically, predicates which accept a dative experiencer subject are those which designate a physical or psychological state, such as ‘being cold’ or ‘being sad’, or mental events such as ‘becoming angry’, as shown in (10).

(10) Urdu

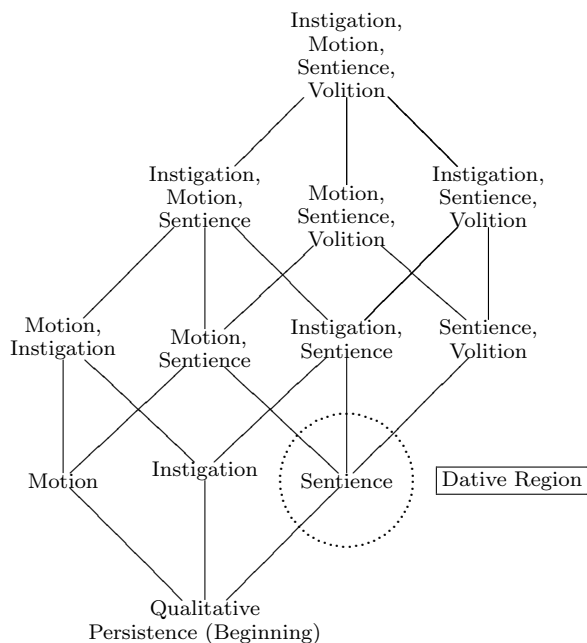


Fig. 7 Region of the Dative

Mujhe ghussa aaya
 Pron.1.SG.DAT anger.M.SG.NOM come:PRF.M.SG

I got angry.

The tendency to employ the dative case, the case marking recipients, to mark “experiencer” subjects follows directly from the considerations above—the entailments associated with the experiencer subjects of psychological predicates coincide with the region ascribed to the dative in its uses as a marker of recipient. These predicates require that the subject is sentient, as they are psychological verbs, and that the subject undergoes some sort of qualitative mental change, viz. a psychological change of state. Accordingly, the properties of the core usage of the dative across three-place predicates, namely *qualitative persistence* and *sentience*, align with the use of datives in one-place predicates. Uses of case such as the dative marking experiencer subjects have often been seen as idiosyncratic, but the above demonstrates that these types of case assignment fall out naturally from the semantic properties associated with a case marker and the semantic properties demanded by such psychological predicates. The observation regarding an abstract similarity between recipients and experiencers is nothing new: the contribution here is providing a framework which makes this connection perspicuous.

5.1.2 The Dative as a Second Argument in Two-Place Predicates

Another common extension of the use of the dative is to mark the second argument of certain classes of two-place verbs such as *help* or *trust* (Blake 2001). Blume (1998), based on a cross-linguistic sample, subsequently extended in Ball (2009), discusses several classes of these verbs, including certain verbs of communication, such as *danken*

‘thank’ and *gratulieren* ‘congratulate’, as well as verbs where one participant serves the interests of the other, such as *dienen* ‘serve’ or *helfen* ‘help’³ (p. 254). Blume provides an analysis of these predicates which emphasizes that they designate a complex event in which “each participant in the complex event is independently active in at least one of the subevents”.

The lattice provides an alternate view: for languages which dispose of multiple uses of a case, one should be able to distill common semantic characteristics which cut across the divergent uses and inhabit a connected region of the lattice. In this instance, as the canonical dative designating a recipient was established as the connected region delimited by *sentience* on the *qualitative persistence (beginning)* branch, it follows for the extended use of the dative with two-place predicates that these predicates entail semantic properties for their second argument which coincide with the established region of the dative.

On examining the predicates which take dative objects in German, it can be seen that the semantic entailments of the second argument do correspond with the region of canonical dative recipients. While the verbs of communication discussed by Blume are two-place verbs, on a semantic level they correspond closely to the class of three-place “illocutionary verbs of communication” (Pinker 1989: 112), such as *tell*—called “illocutionary verbs” as the verbs name the illocutionary act being performed. Pinker analyzes the third argument of such verbs as recipients, which also undergo “caused possession” just as with canonical *give* verbs, and specifies that the third argument of *tell* undergoes a change in “cognitive possession”, where to cognitively possess includes to know, perceive or learn. According to Pinker, this analysis of the third argument as a recipient in turn accounts for why such verbs participate in the dative alternation in English.

The two-place verbs such as *danken* ‘thank’ and *gratulieren* ‘congratulate’ support exactly the same analysis. The second argument here as well undergoes “caused possession” in the cognitive realm, and, in turn, qualifies as qualitative change, locating the argument on the *qualitative persistence (beginning)* branch. As this occurs in the cognitive realm, this argument also entails *sentience*. The second class of verbs such as *dienen* ‘serve’ or *helfen* ‘help’ also entail qualitative change, for if the entity designated by the second argument is successfully served or helped, their situation changes via the benefits bestowed upon them. As Blume makes clear, these verbs canonically involve human interaction, and accordingly *sentience* is also entailed.

Given that the dative case in German maps to the region of the semantic properties associated with indirect objects, which is the primary grammatical function marked by the dative, the lattice provides a clear reason why arguments of a two-place predicate would be marked by the dative, despite the fact that they are not the third argument of a three-place verb, i.e. standard indirect objects. Both indirect objects and the second arguments of the verbs discussed by Blume are fundamentally similar in

³ A third class of verbs discussed by Blume are those of relative motion or pursuit, such as German *folgen* ‘to follow’ or *begegnen* ‘to meet’. These verbs were shown in McFadden (2004) to be better analyzed as intransitives taking an allative complement rather than as second participants acting independently, which is also an avenue of explanation available for *gehörchen* ‘obey’, which is etymologically derived from *hören* ‘listen (to)’. Such verbs involve spatial relations, in addition to participant relations, and as such are not directly represented on the agentivity lattice. The need to connect the participant and spatial relations has been increasingly recognized (see Butt (2006); Ganenkov (2007)), and nothing prohibits employing the agency lattice to model the interaction between different parameters, such as agency as space, although this is a subject for future research.

their participant properties. As the second argument of verbs such as *thank* and *serve* map to the same region occupied by the dative as a marker of indirect objects in German, the use of the dative case to mark these second arguments is appropriate. This explanation of the dative with these verbs follows directly from the structured participant properties, without needing to make reference to complex events as in the approach of Blume.

The similarity between more standard recipient datives and dative objects of two-place predicates is further brought out in Maling (2001). She points to a number of syntactic asymmetries shared by the two types of arguments both in English and German, such as the inability to either form synthetic compounds or to undergo middle formation, as in **Host-thanking is common courtesy* (p. 423) and **He helps with difficulty* (p. 436), respectively. Maling argues that such dative objects show the behavior of goals/recipients just as indirect objects do, and the restrictions on, for instance, middle formation arise from thematic restrictions, a view consonant with the analysis presented here.

To summarize the discussion so far, the data and analyses presented for the divergent uses of the dative show that the implications of the model given here are borne out: if a case marker is used in several different manners, then at a sufficiently abstract level, an amount of semantic commonality is found among the uses. The prediction then is that if a language employs a case to mark seemingly multiple types of arguments, these arguments will share in the same region circumscribed by the primary use of the case.

5.2 The Genitive/Accusative Alternation in Russian

One of the most studied uses of case in Russian is the *genitive of negation* (see, for instance, Babby (1980), Pesetsky (1982), Neidle (1988) or Partee and Borschev (2002)). As shown in the example below, a nominal within the scope of negation can be optionally marked by the genitive.

(11) Russian

- a. Ja pil vodu/*vody
 I drink.PST water:ACC/water:GEN
 I drank (was drinking) water.
- b. Ja ne pil vodu/vody.
 I NEG drink.PST water:ACC/water:GEN
 I didn't drink water. (Kagan 2007:1)

Aside from its use in negative contexts, the genitive also participates in a less studied alternation with the accusative, as shown in (12), repeated from section 1.

(12) Russian

- a. Ivan ždět tramvaj
 Ivan wait-for.PRES tram.ACC
 Ivan is waiting for the/a certain tram.
- b. Ivan ždět tramvaj-a
 Ivan wait-for.PRES tram-GEN
 Ivan is waiting for a tram. (Wierzbicka 1981:56)

The choice of case for the object in (12) signals a semantic contrast: when marked by the accusative, a specific or definite reading, while when marked by the genitive, a non-specific reading. I will show that this contrast arises naturally due to an interaction between the semantic properties of the agentivity lattice and degrees of definiteness of the noun phrase.

This alternation is limited to a small set of verbs meaning *seek*, *await*, *demand*, *want*, *fear*, *avoid* (Timberlake 2004). Such verbs are recognizably intensional—to want or fear something does not require that thing to actually exist. Further, these verbs are “opacity-creating verbs” (Zimmermann 1993), which permit both wide- and narrow-scope readings, as in the sorts of examples due to Karttunen (1976):

- (13) a. Peter wants to marry a Swede—although he has never met one.
 b. Peter wants to marry a Swede—although she isn’t willing.

In the narrow-scope usage, (13a), the Swede is a non-specific Swede—Peter will marry any Swede. In (13b), the wide-scope usage, there is a specific Swede to which reference is made. In (12), the genitive aligns with the narrow-scope interpretation and the accusative with the wide-scope interpretation.

To establish where the genitive and accusative map on the agentivity lattice, it suffices to look at their primary uses. The central use of the genitive when governed by verbs is in the genitive of negation construction, as in (11) where it correlates with lack of existence. Timberlake (2004) observes that “when an existential predicate is negated, the entity whose presence is denied is expressed in the genitive” (p. 302). In terms of the agentivity lattice, the governed genitive is used when existence of the object is not entailed during the event, and therefore the genitive is associated with the lowest node of the lattice, *total non-persistence*. In contrast, the accusative case marks objects of transitive clauses. As discussed in 4, these objects are generally affected in some way and accordingly must exist before the event. Therefore, the region of the accusative covers at least the node *existential persistence (beginning)*, from where it spreads outward. While opacity-creating verbs entail various agentivity properties in their subjects, as they do not entail existence of their object, they have no entailments for their object. The regions of the genitive and the accusative then divide up the space consistent with objects of opacity-creating verbs.

The alternation in (12) involves not only verbal semantics, but also the referential properties of NPs instantiating the verbal arguments. The parameter of definiteness can be submitted to a feature-based treatment consonant with that of the agentivity properties. Categories of definiteness can be reworked as a set of features (e.g. *referring* and *given*) ordered by inclusion, as in (14a), and corresponding to the definiteness hierarchy given in (14b)⁴.

- (14) a. $\emptyset < referring < referring, given$
 b. Non-Specific Indefinite < Specific Indefinite < Definite

As opposed to the agentivity features which are entailments of the predicate for an argument, definiteness concerns the referent of the argument. When a predicate’s argument is instantiated with a noun, both agentivity features and the features underlying the definiteness hierarchy interact, constraining the possible combinations. The primary

⁴ Here I only establish the segment of the definiteness hierarchy sufficient for modelling the alternation under consideration. For a more complete treatment of the interaction of both animacy and definiteness with the agentivity lattice, see Grimm (2005).

factors underlying the alternation are the interaction between the *persistence* entailments and whether a given noun is referential, which produce the observed interpretations associated with the genitive and accusative. In essence, as referring arguments only have wide-scope interpretations (Ioup 1977), and the genitive marks the narrow-scope interpretation where the existence of the object is not entailed, a referring object is inconsistent with the semantics of the genitive. Instead, a referring argument forces a wide-scope interpretation, which *is* consistent with the semantics of the accusative.

The proposed framework delivers the semantic interpretations in a straightforward fashion. The referentiality of the NP determines which nodes of the lattice it may instantiate. NPs that are specific or higher on the definiteness hierarchy, hence *referring*, imply that the entity exists. Upon combining with the agentivity properties entailed by the predicate, the instantiated argument must then minimally possess the feature *existential persistence (beginning)*, which locates it in the region of the accusative case. If the NP is non-specific (non-referring), when instantiating the argument, it can remain on the lowest node of the lattice, since independent existence is not entailed—but then this locates it in the region of the genitive case. Therefore, definiteness is the crucial factor underlying this alternation, but it is mediated by the particular semantics of the verb, i.e. agentivity properties. This interaction in turn explains the alternation’s limited distribution—only verbs which have no *existential persistence* entailments on their objects will license the genitive.

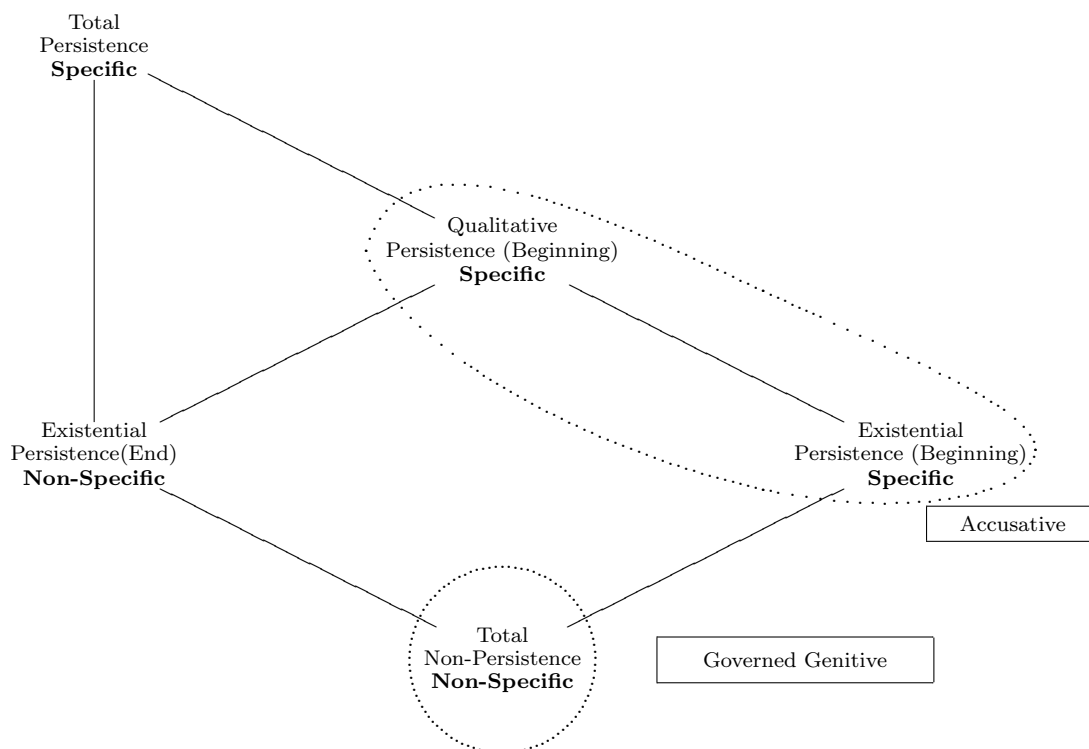


Fig. 8 Russian Genitive and Accusative Mappings

Since the above analysis was first proposed in Grimm (2005), Kagan (2007) independently presented a detailed semantic analysis of the genitive/accusative alternation, asserting that the relevant distinction between the accusative or genitive assignment is existential commitment, or lack thereof. Essentially, Kagan (2007) proposed that intensional predicates which do not presuppose existential commitment license the genitive case, whereas when existential commitment is present, the accusative case is licensed. Given that existential commitment correlates with *existential persistence*, the analysis of Kagan (2007) converges well with the predictions made by the agentivity lattice.

The account of this case alternation demonstrates that the system can at once capture typological generalizations as discussed in section 3, but also can derive an explanatory account of semantically nuanced case alternations.

6 Outlook

A re-working of the approach of Dowty (1991) into a single set of privative features hierarchized in a lattice has led to a structured framework which can account for the underlying semantics of case realization. The versatility of the framework has been shown through a variety of applications, from capturing typological generalizations to nuanced case alternations. Treating case as a semantic system has provided a perspective from which the heterogeneous uses of case can be viewed as systematic on a semantic level. Uses of a single case which are functionally quite diverse, as observed for the polysemy of the dative, are at the same time semantically cohesive. Since a case system is a semantic system embodying oppositions and contrasts, phenomena such as case alternations, where the use of one case rather than another signals a semantic contrast, are expected.

While the account here has concentrated on the contribution of semantic properties connected to the notion of agentivity, there are clearly other factors which enter into case assignment, most clearly spatial uses of case and their connection to argument marking. One of the most promising facets of the approach taken here is the possibility of modelling the interaction between different semantic parameters, such as the interaction between agentivity and definiteness displayed in the analysis of the genitive/accusative alternation in Russian. The current approach provides a general framework for further exploration of the interaction between semantic parameters and the resultant patterns of marking.

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References

- Ackrill J (1987) *A New Aristotle Reader*. Princeton University Press
- Aissen J (2003) Differential object marking: Iconicity vs. economy. *Natural Language and Linguistic Theory* 21:435–483
- Arkadiev P (2009) Differential argument marking in two-term case systems and its implications for the general theory of case marking. In: *Differential Subject Marking*, Springer
- Babby L (1980) *Existential Sentences and Negation in Russian*. Karoma Publishers
- Ball D (2009) *Clause structure and argument realization in Tongan*. PhD thesis, Stanford University
- Blake B (2001) *Case: 2nd Edition*. Cambridge University Press
- Blume K (1998) A contrastive analysis of interaction verbs with dative complements. *Linguistics* 36(2):253–280
- Bossong G (2006) Le marquage différentiel de l'objet dans les langues d'europe. In: Feuillet J (ed) *Actance et Valence dans les Langues de l'Europe*, Mouton de Gruyter, pp 193–258
- Butt M (2006) The dative/ergative connection. In: Bonami O, Hofherr PC (eds) *Empirical Issues in Syntax and Semantics 6*, Academic Press
- Comrie B (1989) *Language universals and linguistic typology*. 2nd edition. University of Chicago Press
- Cruse D (1973) Some thoughts on agentivity. *Journal of Linguistics* 9:11–23
- Davis A, Koenig JP (2000) Linking as constraints on word classes in a hierarchical lexicon. *Language* 76:56–91
- Davis AR (2001) *Linking by Types in the Hierarchical Lexicon*. Stanford: CSLI Publications
- Dowty D (1991) Thematic proto-roles and argument selection. *Language* 67:547–619
- Fillmore C (1968) The case for case. In: Bach E, Harms RT (eds) *Universals in Linguistic Theory*, Holt, Rinehart and Winston
- Ganenkov D (2007) *Experiencer coding in Nakh-Daghestanian*. In: Kulikov A L Malchukov, de Swart P (eds) *Case, valency and transitivity*, John Benjamins
- Grimm S (2005) *The Lattice of Case and Agentivity*. Master's thesis, Institute for Logic, Language and Computation: Universiteit van Amsterdam
- Grimm S (2007) *The bounds of subjecthood: Evidence from instruments*. In: *Proceedings of Berkeley Linguistics Society 33*, Berkeley Linguistics Society
- Haspelmath M (2003) The geometry of grammatical meaning: Semantic maps and cross-linguistic comparison. In: Tomasello M (ed) *The new psychology of language*, vol 2, Lawrence Erlbaum, pp 211–242
- Haspelmath M (2005) Argument marking in ditransitive alignment types. *Linguistic Discovery* 3:1–21
- von Heusinger K (2008) Verbal semantics and the diachronic development of differential object marking in Spanish. *Probus* 20:1–33
- Hopper PJ, Thompson SA (1980) Transitivity in grammar and discourse. *Language* 56:251–299
- Ioup G (1977) Specificity and the interpretation of quantifiers. *Linguistics and Philosophy* 1:233–245
- Jakobson R (1936) Contribution to the general theory of case: General meanings of the Russian cases. In: Waugh LR (ed) *Russian and Slavic Grammar: Studies 1931-1981*, Mouton, pp 59–103

- Kagan O (2007) Property-denoting NPs and non-canonical genitive case. In: *Proceedings of Semantic and Linguistic Theory 17*, CLC Publications
- Karttunen L (1976) Discourse referents. In: McCawley J (ed) *Syntax and Semantics 7: Notes from the Linguistic Underground*, Academic Press
- Kearns K (2000) *Semantics*. London: Macmillan Press.
- Kittilä S (2002) *Transitivity: Towards a comprehensive typology*. PhD thesis, University of Turku
- Levin B, Rappaport Hovav M (2005) *Argument realization*. Cambridge University Press
- Mahootian S (1997) *Persian*. Routledge
- Malchukov AL (2005) Case pattern splits, verb types, and construction competition. In: Amberber M, de Hoop H (eds) *Competition and Variation in Natural Languages: the Case for Case*, Elsevier, pp 73–117
- Maling J (2001) Dative: the heterogeneity of the mapping among morphological case, grammatical functions, and thematic roles. *Lingua* 111:419–464
- McFadden T (2004) *The position of morphological case in the derivation: A study on the syntax-morphology interface*. PhD thesis, University of Pennsylvania
- Næss r (2007) *Prototypical Transitivity*. John Benjamins
- Neidle C (1988) *The Role of Case in Russian Syntax*. Reidel
- ParTEE BH, Borschev V (2002) Genitive of negation and scope of negation in Russian existential sentences. In: Toman J (ed) *Annual Workshop on Formal Approaches to Slavic Linguistics: the Second Ann Arbor Meeting 2001 (FASL 10)*, Michigan Slavic Publications
- Pesetsky D (1982) *Paths and categories*. PhD thesis, MIT
- Piñon C (2007) Verbs of creation. In: Johannes Dölling THZ, Schäfer M (eds) *Event structures in linguistic form and interpretation*, Mouton de Gruyter
- Primus B (1999) *Cases and Thematic Roles: Ergative, Accusative and Active*. Tübingen: Niemeyer
- Ramsay A (1992) Presuppositions and wh-clauses. *Journal of Semantics* 9:251–286
- Rappaport Hovav M, Levin B (2008) The English dative alternation: The case for verb sensitivity. *Journal of Linguistics* 44:129–167
- Rozwadowska B (1988) Thematic restrictions on derived nominals. In: Wilkins W (ed) *Syntax and Semantics*, vol 21, Academic Press, pp 147–165
- Schlesinger IM (1989) Instruments as agents: On the nature of semantic relations. *Journal of Linguistics* 25:189–210
- Smyth HW (1920) *Greek Grammar*. Harvard University Press
- von Stechow A (1999) Temporally opaque arguments in verbs of creation. In: Cecchetto B, Chierchia G (eds) *Festschrift per Andrea Bonomi*, CSLI Publications
- Testelec YG (2007) On two parameters of transitivity. In: Kulikov L, Vater H (eds) *Typology of Verbal Categories*, Tübingen: Niemeyer, pp 29–45
- Timberlake A (2004) *A Reference Grammar of Russian*. Cambridge University Press
- Tsunoda T (1981) Split case-marking in verb types and tense/aspect/mood. *Linguistics* 19:389–438
- Tsunoda T (1985) Remarks on transitivity. *Journal of Linguistics* 21:385–396
- Tuite K, Agha A, Gracyck R (1985) Agentivity, transitivity and the question of active typology. In: Eilfort W, Kroeber P, Peterson K (eds) *Papers from the Parasession on Causitives and Agentivity at the 21st Regional Meeting of the Chicago Linguistics Society*, Chicago Linguistics Society, pp 252–270
- Van Valin Jr RD, Wilkins DP (1996) The case for “effector”: Case roles, agents, and agency revisited. In: Shibatani M, Thompson SA (eds) *Grammatical Constructions:*

Their Form and Meaning, Oxford: Clarendon Press

Wierzbicka A (1981) Case marking and human nature. *Australian Journal of Linguistics* 1:43–80

Zimmermann TE (1993) On the proper treatment of opacity in certain verbs. *Natural Language Semantics* 2(1):149–179