

Cross-linguistic Semantics of Tense, Aspect and Modality

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Cross-linguistic Semantics of Tense, Aspect and Modality.

Edited by Lotte Hogeweg, Helen de Hoop and Andrej Malchukov

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Preface

In November 2006 the workshop “TAM TAM: Cross-linguistic semantics of Tense, Aspect, and Modality” took place in Nijmegen, the Netherlands. The aim of the workshop was to focus on the domain of tense, aspect, and mood/modality and to bring together formal semanticists with a cross-linguistic perspective or working on lesser-known languages, and typologists interested in semantic theory, to discuss semantic variation in this domain. The present volume is the result of this encounter. We are thankful to all the participants of this workshop for the interesting discussions and exchange of ideas. We are especially thankful to the contributors of this volume for making it an interesting and varied collection. Furthermore we wish thank all the reviewers for their help in refereeing the papers. Finally, we are thankful to the Royal Netherlands Academy of Arts and Sciences for funding the workshop.

The semantics of tense, aspect and modality in the languages of the world

Lotte Hogeweg, Helen de Hoop & Andrej Malchukov

Language can be used to describe what is going on in the world. Typically, nouns are used to refer to the individuals in the world, i.e., the participants in the events, while verbs are used to refer to the events themselves. Obviously, verbs do not only refer to events that involve true activities, but also to states and processes. We will use the term *eventualities* as a comprehensive term for events, states and processes (cf. Bach 1986). It goes without saying that language can also be used to say things that go beyond a description of the actual, current world. Firstly, one can situate eventualities in time, e.g., talk about events that happened (in the past) or will happen (in the future). Secondly, one may indicate whether eventualities have started, are going on, or have been or will be completed. Thirdly, one can talk about eventualities of which it is not clear whether they are real, i.e., whether they have been or will be realized at all. The time, the nature, and the factuality of eventualities can be marked on the verbs, by means of tense, aspect, and mood or modality marking. But across languages the categories of tense, aspect and modality, are not uniformly expressed in syntax or morphology, and also from a semantic point of view we find much variation. This book aims to give greater prominence to the semantic richness of tense, aspect, modality, and their interactions, in the languages of the world.

1. Interactions between tense and aspect

While tense and aspect are clearly different categories, they also interact with each other. In Dutch, for example, the fact that an eventuality took place in the past can be expressed by a simple past tense but also by a perfect tense, which merely indicates that the eventuality has been completed, but clearly one can infer from that that it must have taken place in the past. A category similar to perfect tense is the perfective aspect as found in Slavic languages, which shares with the perfect the implication that the event is completed (albeit not necessarily in the past). This predicts that the semantics of perfective aspect and present tense exclude

each other, since perfective aspect indicates that the eventuality has been completed, while present tense refers to an eventuality that is taking place currently. Andrej Malchukov (this volume) presents a typological case study of what happens when present tense and perfective aspect are combined. In line with Comrie (1976), Malchukov argues that it is less relevant to distinguish between perfective and imperfective aspect for eventualities in the present or future than for eventualities in the past. In fact, the combination of those values with ‘present perfective’ is semantically infelicitous. Malchukov investigates the outcome of combinations of the two categories that are infelicitous for semantic reasons, and he shows that, dependent on the mode of expression of a particular language, the present perfective is either blocked or reinterpreted. When categories of tense and aspect are expressed independently of each other, as in the Slavic languages, its combination is available but what meaning does such a combination get? The infelicitous combination of present tense and perfective aspect can give rise to different interpretations. For example, in South Slavic languages such as Bulgarian, a generic or habitual reading is obtained for the present perfect (Comrie 1976), while in Russian, the present perfect is usually interpreted as future tense, as illustrated below (Malchukov, this volume):

RUSSIAN

- (1) *On idet.*
 he GO.IMPV.PRES.3SG
 “He goes.”
- (2) *On pri-det.*
 he PFV-go.PRES.3SG
 “He will come.”

Malchukov argues that the rise of the future meaning in Russian can thus be attributed to the clash of the present tense form with the perfective value. The general pattern cannot be overlooked: the future meaning arises exactly in contexts where the present meaning is blocked. Hence, the conflict between present tense and perfective aspect is solved by the emergence of a different meaning (the future meaning) which is not faithful, neither to the semantics of the present tense (an event in the future is not an event in the present) nor to the semantics of the perfective aspect (an event in the future is not completed yet).

The resolution of the conflict is different in Bulgarian, where the perfective shifts to a generic or habitual reading in the presence of present tense, which can be conceived of as *coercion*, following de Swart (1998) and Michaelis (2004). That is, the habitual reading is faithful to the semantics of present tense rather than to the semantics of perfective aspect. We might say that in the Bulgarian case the present tense comes out as the winner of the conflict between the two.

Malchukov (this volume) captures the combination of tense and perfective aspect in a hierarchy of markedness in which the combination of present tense with perfective aspect is more marked than a combination of future tense with perfective aspect which in turn is more marked than a combination of past tense with perfective aspect. Malchukov argues that probably the most natural way of modeling this markedness approach to the interaction of categories is by taking an Optimality Theoretic perspective along the lines of Aissen (1999, 2003). On the basis of the markedness hierarchy he proposes the following constraint hierarchy:

$$*PFV\&PRES \gg *PFV\&FUT \gg *PFV\&PAST$$

The blocking of infelicitous combinations can be accounted for by ranking faithfulness constraints relative to this constraint hierarchy. The faithfulness constraints, $FAITH(PFV)$ and $FAITH(PRES)$, require a perfective form to express a perfective meaning and a present tense form to express a present tense meaning. Finally, Malchukov introduces an analysis in the framework of Optimality Theory semantics (Hendriks & de Hoop 2001) to account for the meaning shifts that can result from using marked combinations of categories.

A similar meaning shift is also discussed by **Corien Bary** (this volume) who deals with the aspectual difference between the perfective (in fact, *aorist*) and the imperfective in Ancient Greek. Bary compares the Greek Aorist aspect to the French Passé Simple and the Greek Imperfect to the French Imparfait and shows that they have much in common. The imperfective aspect can lead to a progressive or habitual interpretation in both languages and the Aorist and Passé Simple can both lead to an inchoative or bounded interpretation. Given that one form has several interpretations, Bary asks the question what these interpretations have in common. The answer is that the perfective presents an eventuality as quantized, while the imperfective presents it as homogeneous. But how do these meanings come about? Bary argues that a coercion approach to this issue, as proposed by de Swart (1998), does not work for Ancient Greek. Instead, she argues that the imperfective and perfective can be seen as aspectual operators that each take a set of eventualities as their input. Independently of the aspectual nature of this input, the imperfective maps it onto a set of homogeneous eventualities, whereas the perfective maps it onto a set of quantized eventualities. Thus, Bary accounts for the fact that sometimes the operators do not seem to contribute to the semantics of the sentence, namely, when the nature of the aspectual input, i.e., homogeneous or quantized, is equivalent to the nature of the output. By contrast, semantic effects of the aspectual operators are expected to be found when the input of the imperfective is quantized or when the input of the perfective is homogeneous. This expectation is borne out. Some examples of these meaning shifts in Ancient Greek discussed by Bary are: (i) ‘march to Hellas’ (quantized input) in the imperfective

gets a progressive reading (homogeneous output), i.e., ‘was marching to Hellas’; (ii) ‘reigned’ (homogeneous input) in the perfective gets a bounded reading, such that it is clear that the reign had ended (quantized output).

The question is what exactly determines the input of an aspectual operator and what exactly contributes to the aspectual output. **Peter Arkadiev** (this volume) focuses on the different factors that contribute to the aspectual interpretation of sentences in Adyghe, a North-West Caucasian language. Arkadiev makes an important point concerning the interaction of predicates with temporal adverbials, in particular with the adverbials of temporal duration. Usually these adverbs are used to determine the aspectual class of the predicate. Adverbial phrases such as *for an hour* are assumed to indicate imperfective (homogeneous) aspect, while adverbials such as *in an hour* readily combine with perfective (bounded or quantized) aspect. Strikingly, Arkadiev shows that in Adyghe, temporal adverbs actually *contribute* to the aspectual interpretation of the predicates, which of course makes them unsuitable to serve as a test to determine the aspectual interpretation of the predicates (that is, independently of the temporal adverb). Predicates that are able to get both telic and atelic interpretations of one and the same tense form are relatively rare in Adyghe. The picture changes, however, when temporal adverbials are taken into account. Adverbials of temporal duration may co-occur with predicates which in isolation do not allow an atelic interpretation.

Arkadiev argues that this observation should not be explained by ascribing an additional meaning to the lexical meaning of the predicate. Instead, he argues for a compositional account in which temporal adverbials constitute a separate layer of aspectually relevant operators that are able to shift the lexically specified aspectual properties of predicates in a predictable way.

In the same spirit, **Sergei Tatevosov and Mikhail Ivanov** (this volume) examine what happens if an accomplishment verb (which denotes a bounded or telic event, such as *wake up, drown, open*) is combined with an adverbial phrase of duration. They find that in a variety of genetically and geographically unrelated languages, such a combination leads to a *failed attempt* interpretation. One example of this pattern is given in (3)–(4), from Mari (Uralic, Finno-Ugric):

MARI

- (3) *Maša Jivan-em lu minut-ašte kəčkər-ən.*
 Masha Ivan-ACC ten minute.INESS wake.up-PAST
 ‘Masha woke up Ivan in ten minutes.’

- (4) *Maša Jivan-em lu minut kəčkər-ən.*
 Masha Ivan-ACC ten minute wake.up-PAST
 ‘Masha tried to wake up Ivan for ten minutes.’

Apart from accomplishment verbs that allow for a *failed attempt interpretation* (FA), Tatevosov and Ivanov also find accomplishment verbs that allow for a

partial success interpretation (PS) and accomplishment verbs that allow for both (non-restricted accomplishments). Both FA and PS predicates are instances of non-culminating accomplishments. The majority of the theories on how non-culminating events are generated involve a partitive theory on non-culmination which considers non-culminating accomplishments as parts or stages of complete eventualities from the extensions of an original verbal predicate. However, such an operator cannot account for the distinction between PS and FA readings. Tatevosov and Ivanov propose that the difference between failed attempts and partially successful actions lies in the different semantic representation of the corresponding verbal predicates. Tatevosov and Ivanov argue that this difference is not adequately captured by two main approaches to the event structure of non-culminating events: non-decompositional theories and causative theories. Instead they propose a modification of Rothstein's (2004) theory of accomplishment event structure in which an event is divided into subevents (an activity and a change of state) which are incrementally related. Tatevosov and Ivanov argue that the incremental relationship between subevents accounts for the PS verbs but that for the FA verbs a different relationship needs to be defined. They propose a relation that maps the minimal final part of the activity to the whole change of state. For non-restricted accomplishment verbs, the relations between the subevents are underspecified.

The chapter by **Nicoletta Romeo** (this volume) presents a case study on how the meanings of two lexical verbs can extend to meanings in the temporal-aspectual domain. It focuses on the grammatical uses of the Burmese motion verbs 'come' and 'go', i.e., the verbal markers that are metaphorically derived from these verbs. She argues that in general, motion verbs have been proved to be good sources for markers of tense and aspect. The meaning of the two markers is shown to depend on the semantics of the verb they modify. When combined with motion verbs, they express directionality of motion of the participants in the speech act, but when combined with non-motion verbs, they contribute to a change of state meaning, as illustrated in (5) below (Okell 1994):

BURMESE

- (5) *nauʔs^hõu = twī θu = θi seiʔpjeʔ = la = θi*
 last=AT she=SUBJ be.discouraged=COME=REAL
 "At last, she became discouraged."

The verbal markers 'come' and 'go' in combination with non-motion verbs either mark a change of state or mark attainment of the goal of the change. The marker 'come' marks that a change of state is attained through progression in time, as in (5) above. This function as an inchoative/perfective marker represents a metaphorical extension of the directional use; 'entering a state' is presented as 'arriving at a location'. If a change of state is marked by 'go' it is seen as occurring instantaneously.

In this case the change of state is seen from its onset and not from its endpoint. Romeo thus argues that the different uses of the markers ‘come’ and ‘go’ are the result of metaphorical extensions of their lexical meanings to the domains of tense and aspect.

2. Modality and factuality

Modality is defined by Narrog (2005: 184) in terms of factuality: “The expression of a state of affairs is modalized if it is marked for being undetermined with respect to its factual status (...)” This view corresponds to the insight from formal approaches to modality in which modals evoke possible (accessible) worlds that enable us to talk about non-actual situations (cf. Kratzer 1981, 1991; Hacquard 2006).

The distinction between factual and non-factual is clearly related to the distinction between *realis* and *irrealis*, often made in the literature. **Rik van Gijn and Sonja Gipper** (this volume) discuss the category *irrealis* in Yurakaré, an unclassified language of central Bolivia, and in other languages. They focus on four categories that have been argued to fall under the category *irrealis*: future tense, imperatives, negatives and habitual aspect. Having compared the marking of *irrealis* in Yurakaré and several other languages, Van Gijn and Gipper conclude that there is a gradual difference between counterfactual and factual events that ranges from truly counterfactual events through possible events (with an extra distinction between possible events involving speaker commitment and possible events lacking speaker commitment) to factual events. Languages can make a different choice as to where they put the boundary for marking something as *irrealis*.

The topic of the paper by **Rui Marques** (this volume) is the selection of mood in complement clauses in Romance languages. In one group of Romance languages, consisting of Catalan, French, Italian, Portuguese and Spanish, some factive verbs occur with subjunctive and some with indicative complement clauses. In Rumanian (and other European languages such as Modern Greek and Hungarian), on the other hand, factive verbs always govern indicative clauses. In all Romance languages, most non-factive verbs select subjunctive complement clauses, while the indicative is selected by a small group of predicates. A third group of non-factive predicates allows both moods in their complement clauses. This class includes epistemic predicates like *believe*. Equating the indicative/subjunctive distinction to the *realis/irrealis* distinction may explain much of the relevant data but also makes some wrong predictions. The same holds for approaches in terms of veridicality or speech acts. Marques proposes to focus on the modality, by which he means the kind of attitude, that the predicate of the main clauses expresses. He argues that in the Romance language indicative is selected for complement clauses

if the proposition it expresses is verified in all the worlds doxastically accessible to an entity, that is all worlds that are compatible with the entity's beliefs. Subjunctive is selected otherwise. For the group of Romance languages consisting of Catalan, French, Italian, Portuguese and Spanish, an additional requirement for the indicative mood holds, namely that the attitude towards the proposition is of an epistemic or doxastic nature.

Henry Davis, Lisa Matthewson and Hotze Rullmann (this volume) give an analysis of a St'át'imcets circumfix verbal marker that can have five different interpretations: 'ability', 'manage-to', 'accidentally', 'suddenly' and 'non-controllable'. Davis, Matthewson and Rullmann give a unified approach of the circumfix in this Salish language, by analyzing it as marker of circumstantial modality. First they argue for a unification of the 'manage-to' reading with the 'ability' reading. This step is substantiated by showing that the 'manage-to' reading does not have an actuality entailment, unlike the English form *manage to*. Next, they argue that interpretations 'accidentally', 'suddenly' and 'non-controllable' can be subsumed under one unified interpretation 'no-choice'. The core-meaning of this interpretation is that something happened, or *had* to happen, without the choice of any agent. The two basic interpretations that are left are further unified by analyzing the 'ability' interpretation as existential circumstantial reading and the 'no-choice' reading as a universal circumstantial reading. The existential circumstantial reading entails that the facts of the world are such that a certain event is possible. The universal circumstantial entails that the facts of the world conspire to make a certain event inevitable. The existential and the universal reading are unified by analyzing them as choice functions over possible worlds but by varying the size of the set of accessible worlds that are considered.

3. Different approaches to modality

As already became clear in the previous section, the domain of modality is wide and diverse. Current linguistic views on modality are deeply rooted in theories of modal logic. Traditionally, scholars recognise two types of modality: necessity and possibility. Within these types two categories of modality are distinguished: epistemic and deontic modality. The former relates to the truth value of the proposition, what is known about the proposition and what is believed about the proposition. The latter relates to social aspects such as being obliged to do something or giving/being given permission to do something. However, if we look at the types of modality that languages actually express, then other and maybe more important distinctions are attested. One very influential approach to modality is the semantic map approach by van der Auwera and Plungian (1998). This approach

reconstructs semantic similarities of individual categories on the basis of cross-linguistically recurrent polysemy patterns. They basically distinguish four major types of modality: participant-internal, participant-external, deontic (which is actually a subset of participant-external modality), and epistemic. In the present book, two chapters can be read as a reaction to the article of van der Auwera and Plungian (1998).

Kees de Schepper and Joost Zwarts (this volume) compare the semantic map of modality (proposed by van der Auwera et al. 1998) with a more classical approach based on combinations of features. They propose three basic features [\pm propositional], [\pm internal], [\pm deontic] by which the 4 different types of modality distinguished by Van der Auwera et al. can be described. Furthermore, the features predict another type of modality which is indeed attested, namely directed deontic modality (as opposed to non-directed deontic modality). They argue that a feature-based approach allows for fewer possible combinations of meanings than a modal map-approach and that based on at least the Germanic languages, the modal map approach is not justified.

Johan Van der Auwera, Petar Kehayov and Alice Vittrant (this volume) discuss an expression of modality that is related to the verb meaning 'acquire, get'. They call these expressions *acquisitive modals*. The article discusses the phenomenon as occurring in languages in Northern Europe and South(east) Asia. The use of this modal expression in the languages involved challenges the view that the development of modal meaning is unidirectional, namely from participant internal to participant external. Van der Auwera et al. propose to adjust the semantic map of modality by van der Auwera and Plungian (1998) to capture this observation.

Ad Foolen and Helen de Hoop (this volume) address the question of the interpretation of modal auxiliaries in Dutch. They distinguish three basic modal readings, following van der Auwera and Plungian (1998), a participant-internal, a participant-external (including the deontic reading), and an epistemic reading. The Dutch auxiliaries 'can' and 'must' both can get all three readings, but the interpretation that actually arises as the optimal interpretation of the modal auxiliary in a particular context is analysed as the outcome of the interplay of several factors, such as the semantics of the modal complement, tense, aspect as well as subject person. Foolen and de Hoop argue that in a neutral context the Dutch modal verb 'can' gets an ability interpretation, while Dutch 'must' gets a deontic interpretation. Interfering factors such as the type of lexical predicate, aspectual properties, and the person of the subject can trigger a shift in interpretation. Because of the soft nature of the preferences they describe, they analyze them as violable constraints in an Optimality Theoretic framework.

Fabrice Nauze (this volume), too, deals with the polyfunctionality of modal items. He outlines three problems with the standard generalized quantifier approach

to modality. The first problem is based on the predictions the standard approach makes for the effects on the interpretation of modal items when combined with conditionals. The second problem is the restrictions on the possibilities of combining modal verbs. The restrictions are not accounted for by the standard approach. Furthermore, Nauze shows that polyfunctionality is not a cross-linguistic property of modals. Nauze proposes a system in which deontic modality is formalized as *to do*-lists within one world.

4. Case and modality

Not all languages express tense and aspect categories on the verb. In Finnish, for example, differential case marking of the noun can indicate an aspectual distinction (sometimes referred to as ‘aspectual case’). The event in (8) is *unbounded* or *homogeneous* (Kiparsky 1998) while the event in (9) is *bounded* or *non-homogeneous*. This semantic (aspectual) difference between the two is only reflected by a difference in the case of the object. According to Kiparsky, partitive case in Finnish marks *non-homogeneity* at the level of the verb phrase, while others have argued that accusative case in Finnish marks *resultativity* (or perfectivity) of the predicate (Vainikka & Maling 1996).

(6) *Anne rakensi talo-a.*
 Anne build.PAST house-PART
 ‘Anne was building a/the house.’

(7) *Anne rakensi talo-n.*
 Anne build.PAST house-GEN
 ‘Anne built a/the house.’

One might wonder what such a case alternation might do in the context of present tense, however. As pointed out by Malchukov (this volume), as was discussed above, the meaning of perfective aspect (completion) and present tense do not go together easily. The same is expected for accusative case, if this marks resultativity (completion) in Finnish. In fact, the expectation is borne out (Malchukov, this volume), as illustrated in the sentence pair (10)–(11) below:

(8) *Outi lukee kirja-a.*
 Outi read.PRES.3SG book-PART
 ‘Outi is reading a/the book.’

(9) *Outi lukee kirja-n.*
 Outi read.PRES.3SG book-ACC
 ‘Outi will read a/the book.’

This is the pattern described by Malchukov and discussed above: there is a conflict between the semantics of the present tense and the semantics of accusative case (which can be compared to perfective aspect). The outcome of the conflict is the emergence of a future interpretation.

Not only can a case alternation on a noun phrase thus trigger temporal and aspectual meaning distinction, it can sometimes also indicate an alternation in modality. **Barbara Partee and Vladimir Borschev** (this volume) observe, building on their earlier work (Borschev & Partee 2002; Partee & Borschev 2002, 2004), that genitive case in Russian is not only used for direct objects under sentential negation, but also for the objects of some intensional verbs. Partee and Borschev address the question of why the genitive object appears in both constructions. Russian is compared to other languages that mark a similar semantic distinction. In Romance languages, the embedded verb in relative clauses is marked subjunctive in intensional contexts. English has Negative Polarity Items, expressions that may only occur in negative contexts. In some respects, they are similar to the subjunctive in the Romance languages. This raises questions about the relation between negation and intensionality. Partee and Borschev suggest that both types of genitive objects entail a shift of the noun phrase interpretation to a property type. Negation is not an intensional operator itself but negative sentences are able to accommodate a silent operator that licenses the accommodation of a modal interpretation.

Note that in terms of factuality, negation rather corresponds to counterfactuality, whereas intensionality corresponds to non-determined factuality (see also de Haan 1997 on the relation between negation and modality). As was also pointed out above, in the discussions of van Gijn and Gipper (this volume) and Marques (this volume), languages may differ as to where they put the boundary for marking something as non-factual or factual.

The last chapter of the book is by **Anne Tamm** (this volume), whose name is promising in this context, and addresses some issues concerning the Estonian partitive evidential, which was originally a partitive case-marked participle. Tamm argues that the fact that the evidential developed out of an instance of aspectual partitive case marking can explain its particular semantics in modern Estonian. Tamm investigates instances of the evidential in several contexts, distinguishing cases where the speaker has inconclusive evidence or indirect evidence. By showing which combinations of sensory verbs with evidentials are felicitous, Tamm argues that visual evidence is set apart from other types of sensory evidence. However, the hierarchy in sensory evidence also depends on the type of event. The marker can appear when the speaker is surprised over the end-result of a series of events when he has only partial information about the complete course of events. This shows that it does not just mark a lack of believe in the proposition, but also

partial evidence. Furthermore, the use of the evidential in impersonal sentences shows that an analysis in terms of strength of evidence is preferred over a solely indirectness or modality based approach to its semantics.

5. Conclusion

This chapter was meant as an introduction to the present study on the cross-linguistic semantics of tense, aspect and modality. We hope to have given a brief impression of the chapters to follow, which deal with tense, aspect, modality and their interrelationships in the languages of the world. We also hope that it will contribute methodologically in bringing together researchers from different traditions, formal semanticists interested in less studied languages as well as typologists and descriptive linguists interested in linguistic theory. We believe that cross-fertilization of different research paradigms is essential for making progress in the field. We hope that the present volume contributes to the emergent field of semantic typology.

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Incompatible categories

Resolving the “present perfective paradox”*

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In this paper I propose a general approach to the study of constraints on cooccurrence of grammatical categories and present one case study of a functionally infelicitous combination from the domain of TAM categories, the present perfective. It is argued that constraints on co-occurrence of particular categories can be accounted for in terms of local markedness and markedness hierarchies. This approach lends itself naturally for formalization in Optimality Theoretic terms. It was further shown that both production optimization (OT syntax) and comprehension optimization (OT semantics) is needed to model syntagmatic interaction of grammatical categories.

1. Introduction: Typology of syntagmatic dependencies between grammatical categories

Although almost any grammatical description of a language contains information about interaction between grammatical categories, there are still few typological studies that focus on this issue.¹ To my knowledge the only two studies which explicitly address this issue from a typological point of view are Xrakovskij (1996)

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1. Note that here we restrict our attention to cases of ‘syntagmatic’ interaction of grammemes belonging to different categories (as opposed to ‘paradigmatic’ interaction of grammemes belonging to the same category), which is a traditional topic of investigation in linguistic – including typological – studies.

and Aikhenvald and Dixon (1998).² Xrakovskij (1996) represents a pioneering case study of interaction of verbal categories, focusing on the interaction of mood (in particular, imperative, as opposed to indicative) with tense, aspect, voice and person agreement. He concludes that imperative frequently induces changes in the grammemes belonging to other categories, leading to the loss of a category altogether (e.g. tense), of some grammeme of a category (e.g. the passive is normally lacking an imperative), or of some function of a grammeme (as in the case of reinterpretation of aspectual values in the imperative), or else leading to a change in its formal expression (cf. the use of special forms of person agreement in imperative as compared to indicative). Further, Xrakovskij makes the important point that results of grammeme interaction may be asymmetrical: more often than not, (only) one of the grammemes changes its meaning when combined with another grammeme (the one undergoing the semantic shift is called *recessive*, the one inducing the change is called *dominant*). With regard to imperative, his conclusion is that imperative normally acts as a dominant category with respect to other categories. The paper by Aikhenvald and Dixon 1998 is broader in scope, as it studies mutual dependencies between various grammatical categories, both verbal and nominal, in a wide range of languages. One of the most general results of this study is to show that interpretation/availability of nominal categories is more often determined by verbal categories than the other way round (for example, case marking of arguments may depend on choices in the TAM system). Some other unilateral dependencies have been noted as well; for example, negation is found to be more likely to influence availability/realization of other categories, but is hardly affected by other categories itself. However, many other dependencies have been found to be bi-directional; for example either a choice of number or a choice of case system can impose restrictions on members of the other category.

Yet it seems that further cross-linguistic generalizations can be established in this field once a more fine-grained approach is adopted to category interaction. That is, it is important to distinguish between three distinct albeit related phenomena in the domain of interaction between grammatical categories, which are treated indiscriminately in Aikhenvald and Dixon (1998).

1. The presence of grammeme X of category x excludes category y (e.g. in imperatives/subjunctives tense distinctions are normally missing);

2. Equally few are monographic studies which specifically address category interaction in individual languages or cross-linguistically: in this connection a study by Poupynin (1999) on voice/aspect interaction in Russian, and a typological study by de Haan (1997) on interaction of modality and negation should be mentioned.

2. The choice of grammeme X of category x excludes grammeme Y of category y (for example, perfective aspect in many languages is incompatible with the present tense);
3. The choice of grammeme X of category x leads to formal lack of distinction between grammemes Y1 and Y2 of category y (e.g. in many languages there is a larger number of distinct case forms in singular than in plural).

Admittedly, this classification may be less clear-cut in certain cases; for example, if the number of grammemes is restricted to two, the first case is indistinguishable from the third. On the other hand, if a grammeme X may exclude (possibly, for different reasons) all grammemes of y, then the second case converges with the first one. Yet these cases should be kept distinct, since the motivation behind these types of category interaction may be different. In particular, the third case, dealing with neutralization/syncretism, has usually been related to markedness: combinations of unmarked members of categories are known to be less restricted, as compared to the marked one (see Croft 2003: 95–97 for discussion and references). This is different from the case of the 2nd type, which is – inasmuch as it is cross-linguistically recurrent – due to functional (semantic and/or pragmatic) incompatibility: here we are dealing with absolute restrictions on certain combinations rather than with relative preferences. The first case is probably the most complex, since exclusion of different members of a certain grammatical category may be due to both factors (these cases are further discussed in Malchukov, 2006).

The present paper continues the typological research into category interaction initiated by Xrakovskij and Aikhenvald and Dixon. Here I shall mostly concentrate on the cases of the second kind (called hereafter ‘infelicitous combinations’, ICs), where grammemes X and Y are functionally incompatible and therefore a combination of these values is systematically excluded. The paper presents a case study of one infelicitous combination in the aspecto-temporal domain, namely restrictions on combinations of present tense with perfective aspect. However, before addressing this topic, other examples of infelicitous combinations from the domain of TAM categories are briefly discussed in Section 2 to demonstrate possible “resolution” of infelicitous combinations. Section 3 addresses the way present perfectives behave cross-linguistically, focusing on the meaning shifts involved. Section 4 addresses another factor constraining syntagmatic cooccurrence of grammatical categories, namely *relevance*. Section 5 demonstrates how these two factors can be integrated into a single model through the notion of local markedness, and markedness hierarchy. Section 6 argues that constraints on syntagmatic interaction can be fruitfully approached from an optimality-theoretic perspective: it is shown that OT syntactic approaches are able to model blocking effects, but one needs to shift to an OT

semantic perspective to model meaning shifts involved in infelicitous combinations. Finally, Section 7 summarizes the main findings of the paper.

2. Types of infelicitous combinations and their outcomes: Some illustrations

Note that since ICs are infelicitous for semantic reasons, effects of grammeme conflicts will be observed independently of the mode of expression of the respective categories. Yet the outcome of a grammeme conflict may be different depending on the structural properties of the language. If the respective values are expressed cumulatively, as is typically the case in a fusional language, one should expect that the infelicitous combination will not be expressed at all, which will result in a paradigm gap. For example, in Romance languages the distinction between perfective and imperfective (aorist/imperfect) is restricted to past tense and is not found in the present (see below for further discussion). If categories are expressed independently, as is often the case in agglutinative languages, the outcome may be more diverse.

In the latter case we can imagine three primary techniques for conflict resolution of infelicitous combinations: (1) the infelicitous combination is not available at all, due to the mutual incompatibility of the categories in question; (2) the infelicitous combination is available, but involves a change of meaning of one of the grammemes (the ‘recessive’ grammeme, in the terms of Xrakovskij 1996) (3) the infelicitous combination is available, but involves a change of meaning in both grammemes.

In the first case the resolution rules are similar to what we observed in cases of cumulative expression: semantic incompatibility leads to a gap in a paradigm. Consider, for example, the interaction between modal categories in Korean, as described in Sohn (1994). In Korean, the categories of (epistemic) mood and illocutionary force, which cross-linguistically are most often expressed cumulatively, constitute independent categories. Yet not all theoretically possible combinations of moods (indicative, retrospective, requestive and suppositive) and illocutionary force markers (declarative, interrogative, imperative and propositive) are found. While declaratives and interrogatives combine with indicative and “retrospective” (i.e. experiential) moods (see (1)–(3)), imperatives and propositives (the latter expressing the ‘let’s do V’ meaning) share the requestive mood (see (4)–(5)):

Korean (Sohn 1994: 338, 339, 342, 40, 45)

- (1) *Ka-n-ta* / *ka-te-ta*.
 go-IND-DC / go-RETR-DC
 ‘S/he goes/went (I noticed).’

- (2) *Mek-ess-n-unya.*
eat-PST-IND-INT.PLN
'Did (s/he) eat?'
- (3) *W-ass-te-la.*
come-PST-RETR-DC
'He came (I noticed).'
- (4) *Po-si-p-si-o.*
see-SH-AH-REQ-IMP.DEF
'Please, look.'
- (5) *Wuli ilccik ttena-sip-sita.*
we early leave-SH-AH-REQ-PROP
'Let's leave early!'

Notably, other theoretically conceivable combinations (declaratives and interrogatives with requestive mood, or imperatives and propositives with indicative and retrospective moods) are not found (Sohn 1994). Such patterns, where only "natural" combinations of grammemes are available, while less natural combinations are avoided, will be explained as instantiations of local markedness in 6. below.

The second case, where one grammeme (the recessive one) undergoes a semantic shift when combined with another grammeme (the dominant grammeme), is illustrated here with data from the Tungusic languages Even and Evenki. Even, like the genetically related Evenki, has a special habitual marker *-grA-* which is normally used with the past tense reference. When combined with the non-future ("aorist") marker it induces a past tense interpretation. Compare the base form in (6) which, when derived from atelics, has a present tense reference, and the habitual form in (7), referring to the past:

Even

- (6) *Etiken nulge-n.*
old.man nomadize-AOR.3SG
'The old man nomadizes.'
- (7) *Etiken nulge-gre-n.*
old.man nomadize-HAB-AOR.3SG
'The old man used to nomadize.'

In Evenki, the combination of the past habitual aspect and future tense is, expectedly, excluded (Nedjalkov 1992). In Even, however, such a combination is possible, but the meaning of the aspectual marker is reinterpreted to mean 'as before' in the context of tense/mood forms referring to the future:

Even

- (8) *Nulge-gre-d'i-n.*
nomadize-HAB-FUT-3SG
'(He) will nomadize as before.'

- (9) *Nulge-gre-li*.
 nomadize-HAB-IMP.2SG
 ‘Nomadize as before!’

The third case, where both morphemes undergo a semantic shift, can be illustrated by data from Nenets (a Samoyedic language), where a combination of future (suffix) with the past tense (enclitic) is interpreted as irrealis:

Nenets

- (10) *Manzara-nggu=s’*.
 work-FUT-PAST
 ‘s/he would have worked (but...)’

In what follows, I shall focus on the second case of asymmetric infelicitous combinations, which involves a dominant and a recessive grammeme. Cases of the first type (blocking) will be also relevant for the following discussion, inasmuch as recurrent cross-linguistic incompatibility is a hallmark of an infelicitous combination and thus can be used as an IC diagnostic. One of the best studied cases of ICs in the aspecto-temporal domain, which is discussed in this paper, is the semantic incompatibility of perfective aspect with the present tense (other case of infelicitous combinations from the domain of verbal categories are discussed in Malchukov 2006).

3. Perfective presents cross-linguistically: A resolution of an infelicitous combination

As repeatedly noted in the literature (Comrie 1976; Bybee et al. 1994: 83; Bache 1995), a combination of a perfective aspect with the present tense is functionally infelicitous.³ Indeed, the meaning of the perfective aspect, which imposes a bounded, ‘closed’ view of the situation, is semantically incompatible with the (central) meaning of the present tense, locating an event at the moment of speech.⁴ The effects of this semantic incompatibility can be observed irrespective of the mode of expression of tense/aspect categories. Thus, in flectional languages, where aspecto-temporal values are expressed cumulatively, this feature combination is not found; compare

3. For different proposals how this incompatibility should be accounted in semantic terms see (Giorgi & Pianesi 1997), (Borik 2002), (Smith 2007), (Ogihara 2007).

4. We abstract away from those marginal contexts (such as performative use) where the semantic incompatibility of the present tense with the perfective aspect is suspended (see Footnote 7 below).

forms in South Slavic. Note also that while perfective presents can refer to the (generic) present,⁷ imperfective presents cannot (cases of temporal transposition aside)⁸ refer to the future. Also in diachronic perspective it is clear that the present was originally the basic meaning of this form (Bondarko 1971: 51; Comrie 1976); hence the rise of the future meaning can be attributed to the clash with the perfective value within an emerging aspectual opposition. Thus, the general pattern cannot be overlooked: the future meaning arises exactly in contexts where the present meaning is blocked. This is then a mirror image of a situation in Bulgarian, where the perfective shifts from encoding of a single event to series of events in the context of present. For the latter cases the analysis in terms of underspecification or ambiguity on the part of the perfective is still less attractive. In fact, the cases of the latter kind have been described in the literature in terms of shifts or coercion: perfective being coerced into iterative meaning in the context of present tense (Michaelis 2004; see also de Swart 1998 for a general discussion of “aspectual coercion”). Indeed, on the assumption that presents intrinsically select for an unbounded (imperfective) event, its application to a bounded (perfective) event will coerce the habitual operator (cf. Michaelis 2004: 60: “present constructions are intrinsically state selectors”).⁹

Breu (1994) also attributes the difference between South Slavic and East Slavic languages to the fact that in South Slavic the (present) tense is dominant with respect to the aspect, while in East Slavic the aspectual meaning (perfective) is dominant with respect to the temporal one. In our terms, the difference between

7. And even to actual present when the incompatibility between present and perfective is suspended in special contexts, such as in performative use; *Poproshu vyjti* [ask.PFV.1SG leave] ‘I ask you to leave’.

8. Thus we do not consider here cases of temporal transposition involving the present imperfective forms as when this form is used, in an appropriate temporal context, as a historical present (cf. *Idu ja včera domoj* ‘(As) I went (lit go) home yesterday’), or as a scheduled future (cf. *Zavtra ja idu k vraču* lit. ‘Tomorrow I go to the doctor’).

9. As pointed out by an anonymous reviewer an analysis of habitual meaning in terms of coercion is not completely straightforward as perfective presents in the iterative function denote repeated but completed acts, so it is not clear whether the meaning is imperfective. While this is true what counts here is that the complex event referring a series of action is viewed as unbounded rather than bounded, therefore a conventional analysis of iterative as a variety of imperfective rather than perfective (Comrie 1976) seems to be justified. More generally, an analysis in terms of coercion does not imply that the “input” category is eliminated, rather its meaning is augmented (to meet the requirements of the context) in such a way that the output category does not match the input. Thus, when a state is coerced into an inchoative state in the context of a perfective operator (perfective aspect or an aspectually sensitive tense maker) the resultant category qualifies as an event rather than a state (de Swart 1998).

Slavic languages relates to the fact that in Bulgarian the (present) tense is a dominant category and the (perfective) aspect is a recessive category, while in Russian the aspectual grammeme (perfective) is dominant while the temporal one is recessive.

Since the infelicity of the perfective present combination is semantically motivated, IC effects will be observed independently of the concrete mode of expression of tense and aspect categories in the particular language. In this context it is instructive to compare Russian to Finnish, as the outcome of the grammeme conflict is similar in these two languages, even though Finnish differs radically from Russian in the expression of aspectual distinctions. As is well known, Finnish lacks verbal aspect, but an aspectual distinction can be rendered through a case alternation on the object (therefore one sometimes speaks of “aspectual case” in Finnish). The accusative marking of the object as in (14) is used to express perfective (‘bounded’) meaning, while the use of the partitive case as in (15) is used to express imperfective (‘unbounded’) meaning (see Kiparsky 1998 for a detailed discussion):

Finnish (Sulkala & Karjalainen 1992: 306, 308)

- (14) *Outi luki kirjan.*
 Outi read.PAST.3SG book.ACC
 ‘Outi read a book.’

- (15) *Outi luki kirjaa.*
 Outi read.PAST.3SG book.PART
 ‘Outi was reading a book.’

Notably, if a verb is in the (unmarked) present, rather than in the imperfect (past) as in the above examples, the combination with perfective yields the future meaning, similarly to what we observed for Russian:

Finnish (Sulkala & Karjalainen 1992: 308, 306)

- (16) *Outi lukee kirjaa*
 Outi read.PRES.3SG book.PART
 ‘Outi reads/is reading a book’

- (17) *Outi lukee kirjan*
 Outi read.PRES.3SG book.ACC
 ‘Outi will read a book’

Thus, resolution of the perfective present combination in Finnish proceeds similarly to Russian, even though aspect is expressed by a syntactic construction in Finnish rather than an inflectional category as in Russian: in both cases tense is a recessive category, and aspect is dominant.

The same effects can also be observed in languages which have a category of aspect but lack a category of tense altogether. In these languages, a category with

the perfective meaning cannot be interpreted as referring to present even in strong contexts. (Maltese) Arabic is instructive in this respect. Maltese lacks tense, but uses aspectual (perfective/imperfective) forms to render tense distinctions. Notably, the perfective normally refers to the past, in strong contexts it can refer to the future, but it never refers to the present (Borg & Azzopardi-Alexander 1997: 234). Also in Lango, which distinguishes between perfective, habitual and progressive aspects, the perfective aspect may refer to either past or future, but not to the present (Noonan 1992: 138).

4. Other factors underlying grammeme (in)compatibility: Relevance

Above we have considered one factor underlying grammeme (in)compatibility, focusing on cases in which compatibility is semantically motivated. However, semantic compatibility is clearly not the only factor constraining syntagmatic combinability between categories. There are other factors as well, both formal and functional (Malchukov 2006). Form related constraints pertain to individual languages (e.g. distribution of grammemes across morpheme slots in languages with a templatic morphology, which is often idiosyncratic) and will not be discussed here.¹⁰ Among other functional factors to be discussed we single out one factor dubbed ‘relevance’ here:

Regularity of co-occurrence between the members of grammatical categories reflects the degree of their mutual relevance.

The role of this factor can be also illustrated from the domain of tense-aspect interaction. A well-known cross-linguistic generalization states that aspectual distinctions are more often observed in the domain of past tenses (Comrie 1976; Dahl 1985). In particular, Comrie (1976: 71–72) cites example from Romance languages where the aspectual distinction between perfective and imperfective is restricted to the past (aorist vs. imperfect). Other examples are not difficult to come by. For example, in Hixkaryana the tense/aspect system includes, apart from the nonpast in *-yaha*, three different forms referring to the past: immediate past in *-no*, recent past completive in *-yako* and recent past continuative in *-yakonano* (Derbyshire 1979). In Mangarayi, the aspectual distinction (punctual/continuous) is also restricted to the past (Merlan 1982). Comrie’s explanation for this asymmetry

10. As an example of a formal constraint, Malchukov (2006) cites Ika (Chibchan; Frank 1985), where none of the verbal categories can co-occur due to a “one-suffix per word constraint” operating in this language.

invokes the notion of relevance: aspectual qualification is less relevant for actions that have not (yet) occurred (Comrie 1976).

Note that explanation in terms of relevance is more general than an explanation in terms of semantic compatibility. Indeed, while restrictions on the use of aspects with the present tense can be explained in terms of (in)compatibility, this explanation does not carry over to the future tense, which is conceptually compatible with both aspects. Yet we can still follow Comrie in his conclusion that aspectual qualification is less relevant for future non-factive events than for past actions, for which it is often important whether an action has been completed or not. This explanation carries over to the frequent lack/neutralization of tense and aspect distinctions in negative clauses and irrealis moods, as documented by Aikhenvald and Dixon (1998). Similarly, tense distinctions are frequently found only in the indicative mood. By way of illustration consider the case of Nkore-Kiga, where seven different tenses are distinguished in the indicative, while in the subjunctive the tense paradigm is reduced to two, and in the imperative is lost altogether (Taylor 1985: 154). In fact, mutual incompatibility of tense with non-indicative (irrealis) moods, observed in many languages, has led some authors to suggest that tense and mood should be subsumed under one category (Xrakovskij & Volodin 1979). The same observation holds for aspectual distinctions, although the restrictions are less regular here. This case deserves special attention since it is less well documented in the literature (interaction of mood with other categories is not addressed in Aikhenvald & Dixon 1998). Thus, in Koromfe (Rennison 1997), the indicative has a four way tense/aspect opposition (between aorist, past, durative and progressive), while in the imperative only an unmarked/durative opposition survives. In Sanskrit, imperative and optative forms derive from present/imperfective stems. Originally, irrealis moods could be also formed from stems of the aorist and perfect, but later the latter forms disappeared, leading to neutralization of the aspectual distinction (Kulikov, p.c.). In Basque, the subjunctive mood does not distinguish aspects either (Saltarelli 1988: 230). And in Tsakhur (Daghestanian), the aspectual opposition is obligatory in realis ('referential') moods, is optional in hypothetical moods and is absent in counterfactual moods (Majsak & Tatevosov 1998). Significantly, Majsak and Tatevosov also invoke the notion of relevance to account for this gradual reduction of aspectual distinctions in Tsakhur.

Note that some of the restrictions noted above discussed above have been interpreted in terms of markedness in the earlier literature. For example, Aikhenvald and Dixon (1998) attribute the frequent lack of TAM in negative forms to markedness. Yet, this vague use of the notion of markedness has been recently criticized by Haspelmath (2006), who showed that this term covers a heterogeneous set of phenomena, which should be better kept apart (formal complexity, semantic specificity, etc). He further argues that many of the alleged markedness effects are due

to frequency. It is likely that also with respect to the domain of aspect-tense interaction a frequency explanation is appropriate. Thus, it is less relevant to encode aspectual distinctions for events which have not yet happened, hence such encoding would be less frequent in natural languages and less frequently grammaticalized. Moreover, the approach relying on frequency (or “naturalness” of individual combinations as manifested in frequency) can be extended to the domain of infelicitous combinations. By definition, the latter are semantically and/or pragmatically unnatural; hence these combinations are expected to be highly infrequent, and least likely to be grammaticalized. Since this concept of markedness pertains to naturalness of particular combinations, we are dealing here with the phenomenon of local markedness rather than general markedness (see Tiersma 1982; Croft 1990: 144–146 on local (un)markedness). Indeed, general markedness is often unable to explain co-occurrence restrictions between different grammemes, as a particular combination may be “marked” (i.e. less natural) for some members of a grammatical category but “unmarked” (natural) for others. Below, the relation of local markedness which obtain between particular grammemes will be captured in the form of markedness hierarchies.

5. Functional factors in interaction: Markedness hierarchies

As noted above, the phenomenon of local markedness is particularly relevant for the study of the interaction between verbal categories, as it pertains to markedness of certain grammeme *combinations*, rather than to markedness of grammemes *per se* in absolute terms. In the literature, local markedness is also known under the name of “markedness reversal” (Croft 1990). However, given that some categories involve more than one member, patterns of local markedness are better viewed as markedness hierarchies, reflecting the relative naturalness of certain grammeme combinations. This is consistent with Croft’s (1990: 150) observation that many markedness reversal patterns turn out on closer inspection to be multivalued hierarchies. These hierarchies extend from most natural (unmarked) combinations, where grammemes are both compatible and highly relevant to each other’s content, at the one end, to combinations which are functionally incompatible and hence irrelevant, at the other end. In between we find combinations of categories which, although functionally compatible, are less relevant to one another. On this account the infelicitous combinations discussed in this paper represent the most marked combination of grammemes on the markedness hierarchies.

Drawing on the previous discussion as well as on observations in the earlier literature we can set up the following markedness hierarchy for the domain of tense-aspect interaction.

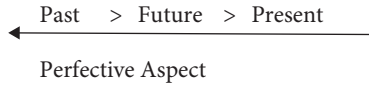


Figure 1. Tense Hierarchy for perfective aspect

As observed by Comrie (1976: 73) and Dahl (1985: 80), the perfective gram-meme (and, more generally, aspectual distinctions involving perfective as a marked member) is not equally compatible with different tenses: it is more often found in the past, less often in the future, and is usually lacking in the present, or else is reinterpreted. As noted above, in Romance languages the aspectual opposition obtains only in the past, while in Greek it is found in both past and future, but not in the present. In the Slavic languages it is extended to the present as well but the present perfective combination is reinterpreted (recall the discussion in 3 above). Evidence for all parts of the hierarchy can also be found together in one single language. Thus, in ChiBemba (Bantu), the aspectual distinctions (between perfective, imperfective and perfect) found in the past are somewhat reduced in the future (future perfect is lacking), and are completely neutralized in the present, which exists only in the imperfective (Chung & Timberlake 1985: 227–228 citing Givón). This pattern is expected, given that aspectual distinctions are most relevant for the past, less relevant for the future, and irrelevant for the present, as the present perfective combination is semantically infelicitous. For imperfective aspect this hierarchy is partially reversed, as imperfective naturally correlates with the present,¹¹ but is partially retained. As noted by Dahl (1985: 110) past imperfective forms are more frequent cross-linguistically than future imperfective forms; this is clearly due to relevance.

As shown in Malchukov (2006), similar hierarchies can be proposed for other types of infelicitous combinations. Thus a semantic map for imperatives, as proposed by van der Auwera et al. (2004) can be read as a markedness hierarchy of the following form (cf. Gusev 2005): 2SG > 2PL > 1PL > 3 > 1SG. This hierarchy predicts that the 2nd person singular forms will be universally available for imperatives, 2PL less so, etc. The 1st person singular forms (and 1st person plural exclusive forms, as opposed to 1st person plural inclusive forms) are least likely to be found in the imperative paradigms. These combinations are functionally infelicitous and therefore either blocked (absent from the paradigms), or reinterpreted. For example, in Even (Tungusic), the functionally infelicitous 1st person singular

11. Mel'čuk (1998: 106) notes, for example, that in Uzbek the imperfective/progressive is restricted to the present tense. More examples of progressives restricted to present tense can be found in Dahl (1985: 94).

imperative combination is reinterpreted as future indicative (i.e. the mood category is recessive), while the 1st person exclusive imperative forms are reinterpreted as inclusive (i.e. the mood category is recessive); Malchukov (2001). In all such cases, the same functional principles underlying relations of local markedness, such as relevance and semantic compatibility, jointly shape the markedness hierarchies. It is possible, as suggested in the functional-typological literature (Greenberg 1966; Croft 1990; Haspelmath 2006), that frequency is ultimately the driving force behind markedness relations and more generally behind markedness as a multidimensional correlation.

6. Constraining interaction of grammatical categories: An optimality-theoretic approach

One natural way to formally model (restrictions on) syntagmatic interaction between grammatical categories is through adapting an optimality-theoretic perspective. As is well known, OT syntactic approaches view grammar as resulting from competition of forms/constructions encoding certain semantic input against a system of ranked constraints. The two most general types of constraints used in the literature are faithfulness constraints forcing a faithful expression of the input information in the output, and markedness constraints, favouring a more economical expression. For the case at hand, we can assume general faithfulness constraints forcing faithful encoding of features of aspect and tense in the output. On this view ranking of faithfulness constraints (FAITH(tense), FAITH(aspect)) over markedness constraint yields a language with a grammatical categories of tense and aspect, while the opposite ranking yields a language lacking the respective categories (cf. Fong 2005 for a similar account).

Also the markedness hierarchies discussed above can be easily incorporated into the OT approaches. For example, Aissen (1999, 2003), in her study of differential case marking, recasts person hierarchies established by Silverstein, Comrie and others as constraint hierarchies disallowing alignment of prominent (animate/definite) arguments with objects rather than subjects. Thus, differential object marking is modelled through interpolation of economy constraints (prohibiting overt case: *Struc_c) into the markedness constraint hierarchies. Markedness hierarchies in their turn are represented through a constraint conjunction of * \emptyset_c ('star zero case') with the constraint hierarchies, forcing overt case on most marked combinations more forcefully. For example, the following constraint ranking would produce (obligatory) case-marking of pronominal and human objects (as in Hindi):

- (18) *Oj/Pro & * \emptyset_c >> *Oj/Hum & * \emptyset_c >> *Struc_c >> *Oj/Anim & * \emptyset_c >> *Oj/Inan & * \emptyset_c

Note that Aissen's analysis makes a crucial use of the notions of *harmonic alignment* (here, alignment of role and person/animacy hierarchies) and *constraint conjunction*, where a certain combination of values is seen as more marked (less natural).

At this point it should be clear that the same tools can be used to model any markedness hierarchy, as proposed in the functional-typological literature. Thus, hierarchy constraining tense aspect interaction can be recast as the following constraint hierarchy:

$$(19) \quad *PFv\&PRES \gg *PFv\&FUT \gg *PFv\&PAST$$

This constraint hierarchy captures the generalization that a combination of the values [present] for tense and [perfective] for aspect is most marked (least natural), hence this constraint is stronger than the constraints against combinations of other values for tense and aspect. The ranking of constraints in the hierarchy (19) is determined by relevance (as defined above), which in its turn may reflect the frequency of certain combinations. This is consistent with the general assumption that more frequent combinations of categories are more readily grammaticalized. The constraint hierarchy further interacts with Faith constraints, requiring faithful marking of the verb for the features of aspect (perfective) and tense (present). In such a way, blocking of infelicitous combinations can be accounted for by interpolating Faith constraints below an infelicitous combination of values:

$$(20) \quad *PFv\&PRES \gg FAITH(PFV), FAITH(PRES) \gg *PFv\&FUT \gg *PFv\&PAST$$

Yet, OT syntax cannot account in a principled way for this ranking, or predict possible meaning shifts in an IC. The first problem is probably not so severe. Indeed, one could argue that the ranking in (20) has a principled reason, namely that the semantic input for the IC is not well-formed, hence IC would be universally blocked. The second, problem however cannot be resolved in a unidirectional OT syntactic approach. For that we shall combine it with an OT semantic approach.

While OT syntax is concerned with a production (meaning-to-form) optimization, OT semantics is concerned with comprehension (form-to-meaning) optimization (Hendriks & de Hoop 2001; de Hoop & de Swart 2000). Thus, it involves evaluation of interpretations of certain forms/constructions by a system of ranked constraints. For the present discussion two general constraints would suffice:

- a. FAITH-INT: penalizes unfaithful interpretation of a given form (in particular, penalizing meaning shifts)
- b. FIT: interpretation should be consistent with the context (in particular, with the context of co-occurring categories).

Both constraints types are well known from the literature (cf., e.g. Zeevat 2000). Here it is assumed that FIT (penalizing an infelicitous combination) is the highest ranking constraint. The meaning shifts are modeled through the ranking of the faithfulness constraints penalizing meaning shifts for the aspectual and temporal categories. Faithfulness is represented in a simplified way in terms of (binary) features, so that a faithful interpretation for a perfective form would be the perfective value (roughly, representation of an event in its totality), rather than the imperfective value. The (most) faithful interpretation of the present tense would be the meaning of (actual) present (roughly, co-occurrence of an event with the moment of speech).

By way of exemplification consider the interpretation of a felicitous (present imperfective) and an infelicitous (present perfective) combination of tense and aspect in Russian (cf. Section 3 above).

Tableau 1. Optimal interpretation of the present imperfective forms in Russian

Input: <i>delaet</i> [PRES; IMPFV]	FIT	FAITH(asp)	FAITH(tense)
☞ ⟨PRES; -PFV⟩			
⟨-PRES; -PFV⟩			*
⟨PRES; PFV⟩		*	
⟨-PRES; PFV⟩		*	*

As shown in Tableau 1, the interpretation of the present imperfective form is unproblematic. FIT is satisfied here by all candidates, hence the most faithful interpretation wins.

Tableau 2. Optimal interpretation of the present perfective forms in Russian

Input: <i>s-delaet</i> [PRES; PFV]	FIT	FAITH(asp)	FAITH(tense)
⟨PRES; PFV⟩	*		
☞ ⟨-PRES; PFV⟩			*
⟨PRES; -PFV⟩		*	
⟨-PRES; -PFV⟩		*	*

In case of perfective presents, the evaluation is more complex. As shown in Tableau 2, the most faithful interpretation loses due to a violation of a higher ranking FIT. The optimal candidate is decided by the ranking of the Faith Constraints. Higher ranking of FAITH(asp) over FAITH(tense) captures the fact that aspect is

a dominant and tense is a recessive category in Russian. The opposite situation, where tense is dominant and aspect is recessive (as in Bulgarian), can be straightforwardly captured through reranking of the faithfulness constraints.¹²

While OT syntax can account for blocking (through a higher ranking of the markedness constraints with respect to FAITH constraints), it cannot account for reinterpretation of forms in infelicitous combinations. The latter can be better accounted from an OT semantic perspective through interaction of FIT and FAITH-INT constraints. On the other hand, OT-semantics has difficulties with modeling blocking, as it takes given forms as its input. Clearly, to account for different outcomes of infelicitous combination (and constraint interaction, in general), combining both optimization perspectives is crucial. For the time being, I assume that this is achieved in a model, as proposed by Zeevat (2000), where constraints on interpretation are used as a filter on top of OT production constraints (an ‘asymmetric bidirectional model’). Another natural way of combining the two optimization perspectives is a (weak) bidirectional OT, as proposed by Blutner (Blutner 2000). The choice between different OT approaches to model syntagmatic interaction between categories is a matter of future research, yet it should be clear that these approaches provide a natural tool for modeling this interaction.

7. Conclusion

In this paper I outlined a general approach to the study of syntagmatic interaction of grammatical categories. In particular, I presented a case study of one infelicitous grammeme combination from an aspecto-temporal domain, the case of perfective presents. As shown above, functionally infelicitous combinations, such as present perfectives, are either blocked or reinterpreted. Apart from functional incompatibility, Relevance (probably derived from frequency) has been argued to be another functional factor constraining grammeme co-occurrence. It is further shown how the two factors can be integrated into a single model, relying on the concepts of

12. The analysis as it stands cannot (and is not intended to) account for interpretation of aspecto-temporal forms in case of temporal transposition, as when present imperfective forms have a historical present or scheduled future reading mentioned in Footnote 8. To account for such cases the model should be extended through introduction of the notion of reference time, or, maybe, ‘topic time’ along the lines of W. Klein (see Klein 1994/9: 133–141 for a discussion of transposition involving historical presents, and Vet 1994 for a discussion of scheduled futures).

local markedness and markedness hierarchy. This approach lends itself naturally for formalization in Optimality Theoretic terms. It was further shown that both production optimization (OT syntax) and comprehension optimization (OT semantics) is needed to model syntagmatic interaction of grammatical categories.

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The perfective/imperfective distinction

Coercion or aspectual operators?*

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I defend an aspectual operator approach of the perfective/imperfective distinction against a coercion approach, as, for example, proposed for French by de Swart (1998). I propose an analysis that follows de Swart on many points, but keeps temporal and aspectual contributions separate. I argue that such an analysis has a larger cross-linguistic coverage than one that combines the two in a single operator. The argumentation is based on the aspectual system of Ancient Greek, but holds for any language in which temporal and aspectual information are encoded in separate morphemes, and in which the opposition perfective/imperfective is not restricted to the past tense. In addition, I show that a coercion analysis is problematic for French as well.

1. Introduction

The perfective/imperfective distinction is grammaticalized in many languages. We find it, for example, in Slavic languages, Ancient and Modern Greek, Latin, French, and Spanish (Dahl 1985). In this paper, I defend an analysis of the perfective/imperfective distinction in terms of aspectual operators against an analysis in terms of coercion. The argumentation is based on the similarities and differences between the aspectual systems of French and Ancient Greek.

Before I lay down the organization of this paper, an important point has to be made about the term *perfective/imperfective distinction*, as the title of the paper may be misleading. The title may suggest that there are scholars who claim that the aspectual shifts that we find with imperfective and perfective aspect should be treated as coercion phenomena. This, however, is not the case. Rather, people who defend a coercion approach, like de Swart (1998) for the *Passé Simple* and

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Imparfait in French, propose that the distinction between the two forms is *not* the distinction between perfective and imperfective aspect, but *instead* should be treated as a coercion phenomenon. In this paper I will continue speaking about *the perfective* and *the imperfective* without hereby implying that these are grammatical aspects or that they should be analyzed as aspectual operators. The expressions are meant as theoretically neutral terms, just to have a name for the distinction that we find in many languages.

I put forth two lines of argumentation in favor of an aspectual operator approach. The first line proceeds from a cross-linguistic perspective. It is based on the aspectual systems of Ancient Greek and French, but holds for other languages as well. The line of reasoning will be the following: The aspectual phenomena in French and Ancient Greek have many similarities. An aspectual operator approach is able to give a uniform account of the data in both languages, whereas the coercion approach cannot be applied to Ancient Greek. Hence, from a cross-linguistic perspective, an aspectual operator approach is superior. The second argument involves language-internal evidence: I will show that the coercion approach is problematic for French, too.

The paper is structured as follows: in Section 2, I discuss the meaning effects associated with the perfective and imperfective in French (Passé Simple and Imparfait) and Ancient Greek (Aorist and Imperfective). We will see that there are many similarities between the Passé Simple and the Aorist and between the Imparfait and the Imperfective with respect to the shifts in aspectual class they trigger.

In Section 3, I discuss three ways of analyzing these meaning effects: one in which they are a coercion phenomenon, and two in which they are analyzed as the effects of aspectual operators. For each option I discuss which properties of the French and Ancient Greek aspectual systems it can handle and which are problematic. We will see that an analysis in terms of aspectual operators works both for languages that behave like French and for languages that behave like Ancient Greek, whereas an analysis in terms of coercion is untenable for languages of the latter type.

In Section 4, I present the conclusion that an aspectual operator approach is preferable from a cross-linguistic perspective.

Throughout the paper, I assume what we may call a one-component theory of aspect (in line with Smith 1997 who calls the theory she proposes a two-component theory). In a one-component theory, the way I use the term, the primary contribution of grammatical aspect is a change in aspectual class: the input of grammatical aspect is an expression of a certain aspectual class and grammatical aspect returns an expression of a possibly different aspectual class. For the perfective/imperfective distinction it has been suggested that the