Cross-linguistic Semantics of Tense, Aspect and Modality

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Volume 148

Cross-linguistic Semantics of Tense, Aspect and Modality.
Edited by Lotte Hogeweg, Helen de Hoop and Andrej Malchukov

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John Benjamins Publishing Company
Amsterdam / Philadelphia



The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences – Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

Library of Congress Cataloging-in-Publication Data

Cross-linguistic semantics of tense, aspect and modality / edited by Lotte Hogeweg, Helen de Hoop, Andrej Malchukov.
p. cm. (Linguistik Aktuell/Linguistics Today, ISSN 0166-0829 ; v. 148)
Includes bibliographical references and index.
1. Grammar, Comparative and general--Temporal constructions. 2. Grammar, Comparative and general--Tense. 3. Grammar, Comparative and general--Aspect. 4. Modality (Linguistics) 5. Semantics, Comparative. I. Hogeweg, Lotte. II. Hoop, Helen de, 1964- III. Mal?chukov, A. L. (Andrei L?vovich)
P294.5.C76 2009
415--dc22 2009030824
ISBN 978 90 272 5531 0 (HB; alk. paper)
ISBN 978 90 272 8893 6 (EB)

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John Benjamins Publishing Co. · P.O. Box 36224 · 1020 ME Amsterdam · The Netherlands
John Benjamins North America · P.O. Box 27519 · Philadelphia PA 19118-0519 · USA

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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.IMPF.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 >> *Pfv&fut >> *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-əšte 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) *nauʔsʰõ̀u = twī θu = θi sei?pjɛʔ = 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 a 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 [± propositional], [± internal], [± 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 en 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 interpretaion. 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)

*I am grateful to two anonymous reviewers for helpful comments, as well as to the audiences at the Verbal Category Interaction Workshop (St-Petersburg, September 2003), TAMTAM workshop (University of Nijmegen, November 2006) and the Workshop on Scales (University of Leipzig, March 2008) for useful discussion. I am especially indebted to Viktor S. Xrakovskij, Helen de Hoop, and Henk Zeevat for valuable advice. I acknowledge the Netherlands Organization for Scientific Research (NWO) for financial support (grant 220-70-003 for the PIONIER project "Case cross-linguistically").

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);

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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 coccurrence 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).

the situation in the Romance languages, where the perfective has past time reference only (Comrie 1976). Where categories of tense and aspect are expressed independently, as in Slavic languages, this grammeme combination is available, but involves reinterpretation of one or the other of the two grammemes.

As is well known, Slavic languages differ in the way that perfective presents are interpreted (see, e.g. Bondarko 1971: 250ff.; Comrie 1976: 66–71; Breu 1994).[5] In South Slavic languages, such as Bulgarian and Serbo-Croatian, the default meaning of a perfective present is generic present (narrative or habitual); see Comrie (1976: 66–71; Breu 1994). Consider the following example from Bulgarian:[6]

Bulgarian (Comrie 1976: 69):

(11) *Spoglednet se, pousmixnet, devojki…*
glance.PFV.PRES.3PL REFL smile.PFV.PRES.3PL girls
'The girls look at one another, smile at one another…'

By contrast, in East Slavic languages, such as Russian, a perfective present is normally interpreted as future:

Russian

(12) a. *On idet.*
he go.IMFV.PRES.3SG
'He goes.'

b. *On pri-det.*
he PFV-go.PRES.3SG
'He will come.'

Only in certain contexts (e.g. in the presence of the habitual particle *byvalo* or modal negation *nikak ne* (see Bondarko 1971 for other contexts)) can the present perfective forms have a generic interpretation:

Russian

(13) *On byvalo pri-det, skazhet.*
he PTCL PFV-go.PRES.3SG say.PFV.PRES.3SG
'He used to come and say.'

As the tense form in (12)–(13) is used to refer to the present when derived from imperfective verbs, and to the future or generic present when combined with perfectives, the meaning of this form in Russian is traditionally defined as non-past or as ambiguous between present and future (see Bondarko 1971). Yet formally, we are dealing here with a present form, which is completely parallel to the present

5. There is a vast literature on the interaction of tense and aspect in Slavic; my account is closest to Breu (1994) (and from a more general perspective to other "interactional" approaches to the aspecto-temporal domain, such as Bache 1995; Smith 1997; Johanson 2000).

6. As an anonymous reviewer points out, the use of perfective presents in Bulgarian is more common in subordinate than in main clauses.

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.

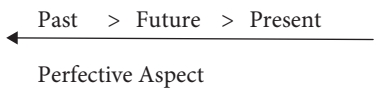


Figure 1. Tense Hierarchy for perfective aspect

As observed by Comrie (1976: 73) and Dahl (1985: 80), the perfective grammeme (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. Meľčuk (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 *ø$_c$ ('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 & *ø$_c$ >> *Oj/Hum & *ø$_c$ >> *Struc$_c$ >> *Oj/Anim & *ø$_c$ >> *Oj/Inan & *ø$_c$

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) *PFv&PRES >> * PFv&FUT >> *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) *PFv&PRES >> FAITH(PFV), FAITH(PRES) >> *PFv&FUT>> *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: ***delaet*** [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: ***s-delaet*** [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

*I thank the participants of the TAMTAM workshop for the discussion, and Emar Maier, Rob van der Sandt, Peter de Swart, and two anonymous reviewers for reading and commenting upon drafts of this paper.

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

relevant aspectual class distinction is that between bounded (quantized, telic) and unbounded (homogeneous, atelic) expressions, in the sense that the perfective makes expressions bounded and the imperfective unbounded.[1] In this paper I explore the possibilities a one-component theory has for analyzing the data. It is important to keep in mind that this is not the only possibility that we have, as some authors explicitly propose a two-component theory (cf. Dahl 1981; Smith 1997; Depraetere 1995; and Klein 1994).[2]

2. The interpretations of the perfective and imperfective

In this section, I will show that the Ancient Greek Aorist gives rise to the same meaning effects as the French Passé Simple, and that the same holds for the Imperfective and Imparfait.[3] I discuss the various interpretations of the Aorist/Passé Simple and of the Imperfective/Imparfait that we find and illustrate each category with an example.

Let us first have a look at the imperfective. In some cases it is not clear that the imperfective adds something to the interpretation of the sentence. That is to say, if aspectually neutral forms (i.e. forms without grammatical aspect) would be available, we expect that a sentence with such a form would get the same interpretation as the sentence with the corresponding imperfective form. A case in point is (1) and its French translation (2) (taken from Herodotus 2003):

(1) *Periandros* … *ēn* *Kupselou* *pais* … *eturanneue*
Periandros.NOM be.IMP Kypselos.GEN son.NOM reign.IMP
de *ho* *Periandros* *Korinthou*
PRT the.NOM Periandros.NOM Korinth.GEN
"Periandros was the son of Kypselos and he reigned over Korinth."
(Herodotus, *Histories*, 1.23)

(2) Périandre … était-IMP fils de Kypsélos; il régnait-IMP à Corinthe.

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1. For references, see Section 3.1.

2. Here I could also add my Ph.D. thesis (Bary 2009), which proposes a novel two-component theory that was developed after the first submission of this paper. This new theory does not suffer from any of the difficulties identified below for one-component theories.

3. In most grammars and studies of Ancient Greek, what I call 'imperfective aspect' is called 'aspect of the present stem' (see, for example, Sicking 1996), and the term 'Imperfect' is exclusively used for the combination of imperfective aspect and past tense (see, for example, Goodwin 1966; Smyth 1956). I prefer my terminology as I believe that it has less danger of confusing the notions of tense and aspect.

All verb forms (*ēn*, *eturanneue*, *était*, *régnait*) are imperfective.

In other sentences, however, the imperfective triggers a special interpretation, for example, in (3):

(3) *Entha kai to hiron harma katalipōn tou*
There PRT the.ACC sacred.ACC chariot.ACC leave.PTCP.AOR the.GEN
Dios hote epi tēn Hellada ēlaune, apiōn
Zeus.GEN when to the.ACC Greece.ACC march.IMP go.back.PTCP.AOR
ouk apelabe …
not get.back.AOR
"After he (Xerxes) had left the sacred chariot of Zeus there when he was marching to Hellas, on his way back he did not get it back …"
(Herodotus, *Histories*, 8.115)

In the context it is clear that Xerxes leaves the chariot 'there' (i.e. in Siris or Macedonia) *during* his march to Greece. This interpretation of the imperfective *ēlaune* corresponds to that of the English Progressive, and therefore I will call it the *progressive* interpretation. We find the same interpretation with the French Imparfait, as we can see in (4) (from de Swart 1998):

(4) *Un jour, je* faisais *mes courses chez l' épicier quand je*
One day I get.IMP my groceries at the grocery.store when I
rencontrai Jean.
meet.PS Jean
"One day, I was shopping at the grocery store when I ran into Jean."

Furthermore, the imperfective can be used to express a habit. (5) is an example from Ancient Greek:

(5) *dōra hoi ana pan etos <u>edidou</u>, kai tēn*
presents.ACC he.DAT PREP every.ACC year.ACC give.IMP and the.ACC
Babylōna hoi edōke.
Babylon.acc he.DAT give.AOR
"Every year he gave him presents and (once) he gave him Babylon."
(Herodotus, *Histories*, 3.160)

The Aorist *edōke* is used for the once-only event of giving, the Imperfective *edidou* for the habit. I call this interpretation of the imperfective the *habitual* interpretation. Note that in (5), a frequency adverbial is present: *ana pan etos 'every year'*. However, as (6) shows, such an adverbial is not required for this interpretation to occur:

(6) *Epi gar Leontos basileuontos kai Hēgēsikleos en*
during PRT Leon.GEN be.king.PTCP.IMP and Hegesikles.GEN in
Spartēi tous allous polemous eutucheontes
Sparta.DAT the.ACC other.ACC war.ACC be.successful.PTCP.IMP
hoi Lakedaimonioi pros Tegeētas mounous
the.NOM Lacedaemonians.NOM against Tegeans.ACC only.ACC
proseptaion
strike.against.IMP
"For when Leon en Hegesikles were kings of Sparta, the Lacedaemonians, while successful in all their other wars, suffered defeats only against the Tegeans."
(Herodotus, *Histories*, 1.65)

Here, the Imperfective is used for the habit of suffering defeats.

An example of the habitual interpretation of the French Imparfait is given in (7) (from de Swart 1998):

(7) *A cette époque-là, je* faisais *mes courses chez l' épicier*
In those days I get.IMP my groceries at the grocery.store
du coin.
at.the corner
"In those days, I shopped at the local grocery store."

Now we turn to the perfective. Again, there are cases in which the perfective makes no clear semantic contribution, such as the perfective of *exedexato* ('receive') in (8) or of *hérita* in its French translation (9) (from Herodotus 2003):

(8) *teleutēsantos de Aluatteō exedexato tēn basilēiēn*
die.PTCP.AOR PRT Alyattes.GEN take.from.AOR the.ACC reign.ACC
Kroisos ho Aluatteō.
Kroisos.NOM the.nom Alyattes.GEN
"After Alyattes died, Kroisos, the son of Alyattes, received the reign."
(Herodotus, *Histories*, 1.26)

(9) A la mort d'Alyatte, Crésus fils d' Alyatte, hérita-PS de la royauté.

With unbounded predicate-argument structures (activities and states), however, the perfective can also indicate the *beginning* of the eventuality.[4]

4. Bach (1986) introduced the term *eventuality* as a cover term for all kinds of situations.

(10) gives an example for Ancient Greek. Note the interpretation of *edakruse* 'weep.AOR':

(10) *enthauta ho Xerxēs heōuton emakarise, meta*
then the.NOM Xerxes.NOM himself.ACC declare.happy.AOR after
de touto edakruse. *Mathōn de min Artabanos*
and that.ACC weep.AOR perceive.PTCP.AOR PRT him.ACC Artabanos.NOM
… dakrusanta eireto tade: "… hōs pollon allēlōn
weep.PTCP.AOR ask.AOR this.ACC how far one.other.GEN.
kechōrismena ergasao nun te kai oligōi proteron.
separate.PTCP.PERF do.AOR now PRT PRT a.little.DAT before
Makarisas gar seōuton dakrueis."
declare.happy.PTCP.AOR because yourself.ACC weep.IMP.PRES
"Then Xerxes declared himself happy, and presently he started to weep. Perceiving that he had begun to weep, Artabanos questioned him saying: 'What a distance is there between your acts of this present and a little while ago! Then you declared your happiness, and now you weep.' "
(Herodotus, *Histories*, 7.45–46)

The present tense form *dakrueis* in the last sentence indicates that Xerxes is still crying at the moment of Artabanos' utterance. This means that the Aorist *edakruse* must be interpretated as indicating the beginning of the crying. I label this use of the perfective the *ingressive* use.

An example of the ingressive interpretation of the French Passé Simple is given in (11) (from de Swart 1998):

(11) *(Soudain,) Jeanne* sut *la résponse.*
(Suddenly,) Jeanne know.PS the answer
"(Suddenly,) Jeanne knew the answer."

With unbounded predicate-argument structures, however, the perfective may also refer to a complete eventuality, from beginning to end. I will call this the *complexive* interpretation. We find this interpretation in the following example. Note *basileusantos* and *ebasileuse*:

(12) *Arduos de <u>basileusantos</u> henos deonta pentēkonta etea*
Ardys.GEN and be.king.PTCP.AOR forty nine years
exedexato Saduattēs ho Arduos kai <u>ebasileuse</u> etea
succeed.AOR Sadyattes.NOM the.NOM Ardys.GEN and be.king.AOR years.ACC
duōdeka
twelve
"After Ardys had reigned for forty nine years, Sadyattes, the son of Ardys, succeeded him and reigned for twelve years."
(Herodotus, *Histories*, 1.16)

In (12), a complexive interpretation is forced upon us by the presence of the duration adverbials *henos deonta pentēkonta etea* 'for nine years' and *etea duōdeka* 'for twelve years'. Again, such adverbials are not required for this type of interpretation, as we can see in (13):

(13) … *Aiguptioi* *meta* *ton* *hirea* *tou* *Hephaistou*
Egyptians.NOM after the.ACC priest.ACC the.GEN Hephaestus.GEN
basileusanta … *estēsanto* *duōdeka* *basileas*
be.king.PTCP.AOR set.up.AOR twelve kings.ACC
"After the priest of Hephaestus had reigned, the Egyptians set up twelve kings."
(Herodotus, *Histories*, 2.147)

In a different context, the participle *basileusanta* can also have an ingressive interpretation. But the context of (13) makes it clear that the setting up of twelve kings takes place after the reign of the priest has *ended*, not just after it has *begun*.

Example (14) (from de Swart 1998) shows that, again, we find this interpretation also with the French Passé Simple:

(14) *Jeanne d'Arc fut une sainte.*
Jeanne d'Arc be.PS a saint
"Jeanne d'Arc was a saint."

In grammars of Ancient Greek, it is common to distinguish two more interpretations of the Aorist, the generic and the so-called tragic interpretation. I will not discuss these in this paper, as I believe that these uses of the Aorist are best understood from a different perspective, viz. from the lack of a form for perfective aspect and present tense in Ancient Greek.

In this section, we have seen that the Greek Imperfective can trigger the same special interpretations as the French Imparfait: they can both lead to a progressive or a habitual interpretation. Furthermore, the Greek Aorist gives rise to the same special interpretations as the French Passé Simple, viz. an ingressive and a complexive interpretation. We find the same meaning effects in other languages, for example, in Modern Greek, Spanish and Slavic languages. In the next section, I will embark on a semantic analysis of these data.

3. The analysis: Homogeneity versus quantizedness

In the previous section, we have seen that the Imperfective/Imparfait can lead to a progressive or habitual interpretation, and the Aorist/Passé Simple to an ingressive or complexive interpretation. This gives rise to the following questions: what do the interpretations of the imperfective have in common? And what about the

interpretations of the perfective? An additional question is: how do the perfective and imperfective interact with the aspectual class of the predicate-argument structure?

In this section, I propose an analysis of the perfective/imperfective distinction that can handle the range of interpretations that we observed. This proposal follows de Swart's (1998) analysis on many points, but at the same time differs from it in some important respects. A rough sketch of this proposal is given in 3.1. In that section, I ignore the differences between de Swart's proposal and mine. These differences are left for Section 3.2, where I discuss two ways in which the initial proposal can be worked out: a coercion approach and an aspectual operator approach. In Section 3.3, I discuss for both options which properties of the aspectual systems of French and Ancient Greek it can handle and which properties are problematic. From this discussion it will follow that for a cross-linguistic theory of the perfective/imperfective distinction an analysis in terms of aspectual operators is preferable.

3.1 A first sketch

Mourelatos (1981) and Bach (1986), among other scholars, note an interesting analogy between the nominal and the verbal domain. In the nominal domain, we distinguish between homogeneous and quantized noun phrases. The NP 'beer', for instance, is homogeneous because a part of beer is still beer. By contrast, 'a book' is not homogeneous, but quantized: if 'a book' applies to an entity, then it does not apply to any proper part of this entity: a part of a book is not a book. In a similar vein, we have homogeneous and quantized predicate-argument structures. A predicate-argument structure is a natural language expression consisting of a predicate with its argument slots filled but without tense and grammatical aspect. *Jane push the car* and *Jane be sick* are homogeneous predicate-argument structures:[5] if the predicate-argument structure applies to an eventuality it can also apply to a proper part of this eventuality. This is different with *Jane write the letter*, which is quantized.

Following de Swart (1998) and others I assume that the predicate-argument structure refers to a set of eventualities. The property of quantizedness can then be defined as a property of predicates of eventualities:

5. These strange expressions are meant to indicate that we abstract away from tense and grammatical aspect, leaving the verb and its arguments. It is very important that they are taken to be without grammatical aspect because, as we wil see, grammatical aspect affects the homogeneous/quantized distinction.

(15) $\forall P(\mathbf{QUA}(P) \leftrightarrow \forall e \forall e'((P(e) \wedge e' \sqsubset e) \rightarrow \neg P(e')))$

This definition resembles that of Krifka (1989a) and states that a predicate is quantized if it never applies to a proper part (this is expressed by '$\sqsubset$') of an eventuality to which it applies. For reasons of simplicity, I define homogeneous simply as not-quantized.

For readers familiar with the Vendlerian classification (based on Vendler 1967), it may be clarifying to note that the group of homogeneous predicates of eventualities is a supercategory of state and activity expressions. Accomplishment and achievement expressions together constitute the group of quantized predicates of eventualities.

In this paper, I follow the idea proposed and explored by several authors (Mourelatos 1981; Bach 1986; and de Swart 1998) that the perfective/imperfective distinction corresponds exactly to the distinction between quantized and homogeneous predicates: the perfective presents an eventuality as quantized, whereas the imperfective presents it as homogeneous. This idea provides an answer to the question what it is that the interpretations of the perfective have in common, and what the interpretations of the imperfective: the ingressive and complexive interpretation of the perfective have in common that the eventuality is presented as quantized, whereas the habitual and progressive interpretation of the imperfective have in common that it is presented as homogeneous.

The perfective and imperfective interact with the aspectual class of the predicate-argument structure in the following way: at both levels we have a distinction between homogeneous and quantized predicates. At the level of the predicate-argument structure this corresponds to the traditional notion of boundedness or telicity. The perfective and imperfective work on the predicate-argument structure and return a quantized and homogeneous predicate, respectively. If the input of the imperfective is already homogeneous, as in (1) and (2), the imperfective makes no semantic contribution. That is, if Ancient Greek would have forms neutral with respect to the perfective/imperfective distinction, with homogeneous predicate-argument structures, the neutral form would mean exactly the same as the imperfective form. On the other hand, if the input is quantized it triggers a special meaning effect: the quantized eventuality is presented as homogeneous. This leads to a habitual interpretation, as in (6) and (7), or progressive interpretation, as in (3) and (4). For the perfective it is exactly the other way around: if the input of the perfective is already quantized, as in (8) and (9), it makes no semantic contribution, whereas if the input is homogeneous the perfective gives a special interpretation. This can be either an ingressive interpretation, as in (10) and (11), or a complexive interpretation, as in (12) and (14). In other words, we find the special interpretations of the perfective and imperfective if the aspectual

classes of the input and the output do not coincide. This idea is illustrated in Figure 1, in which the solid arrow corresponds to the imperfective, the dashed to the perfective.

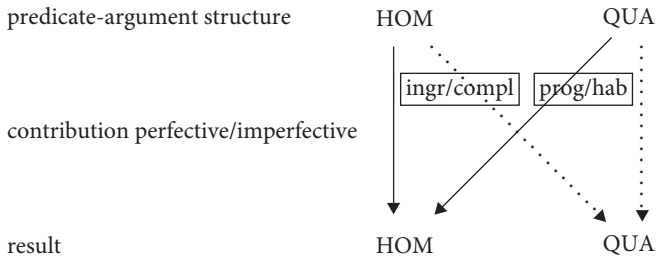


Figure 1. The contribution of the perfective/imperfective

In the next section, I discuss two ways in which the idea sketched above can be made more precise. The two approaches share the general pattern illustated in Figure 1, but differ in the way in which the interpretation is composed.

3.2 Aspectual operators versus coercion

In this section, I discuss two ways in which the idea of the perfective as a *quantizer* and the imperfective as a *homogenizer* can be developed further: in an aspectual operator approach and in a coercion analysis.

I start with a discussion of the aspectual operator approach. I follow de Swart's (1998) treatment of aspectual operators as functions from sets of eventualities (of a certain aspectual class) onto sets of eventualities (of some possibly different aspectual class).[6] Grammatical aspects are aspectual operators. Tense introduces existential closure and maps the eventuality onto the time axis. The scope that is assumed here is given in (16):

(16) [Tense[Aspect[predicate-argument structure]]]

One way to analyze the perfective/imperfective distinction is in terms of a distinction in grammatical aspect. Then the perfective and the imperfective are aspectual operators, that is, functions from sets of eventualities onto sets of eventualities. The rough sketch that I gave in the previous section can then be worked out as follows: both the imperfective and the perfective take predicates of eventualities

6. In contrast to de Swart (1998), but in line with Krifka (1989a), I assume troughout the paper that aspectual classes classify predicates of eventualities (i.e. sets of eventualities) rather than eventualities themselves.

as input, but the imperfective returns homogeneous and the perfective quantized predicates.

This, however, is not the analysis that de Swart (1998) gives for the Passé Simple and Imparfait in French. She argues that the Passé Simple and Imparfait are not grammatical aspects, and hence aspectual operators, but rather *aspectually sensitive tense operators*. This means that they are basically tense operators and that the aspectual shifts that they induce are the result of *coercion*. That is why I will call this analysis a *coercion analysis*. In order to appreciate her analysis, let me first briefly explain the notion of coercion.

The first to use the term *coercion* in the context of aspectual shifts were probably Moens and Steedman in their 1987 paper. The notion of *coercion* can be explained with the examples in (17):

(17) a. #John is being tall.
b. John is being funny.

It has often been noted that the Progressive in English does not combine well with states. Example (17a), for instance, is ungrammatical. Most analyses (e.g. Dowty 1979; Moens 1987) treat the Progressive as an operator that requires an eventive (= non-stative) expression as its input. The sentence in (17b) seems to be an exception to this requirement. Its grammaticality is commonly explained in the following way: the mismatch between the requirements of the progressive operator and the (stative) class of the expression *John be funny* is solved by reinterpretation of the stative expression as an eventive expression, corresponding, for example, to *John act funny* (see e.g. Moens 1987). The argument is *coerced* by the progressive operator into an expression of the required aspectual class. After this reinterpretation, the progressive operator can apply.

Let us return to de Swart's analysis of the Passé Simple and Imparfait. She proposes to analyze the Passé Simple and Imparfait as aspectually sensitive tense operators: they are past tense operators with restrictions on the aspectual class of their input. They are not functions from predicates of eventualities onto predicates of eventualities, but select for particular predicates. The Passé Simple selects for quantized predicates, the Imparfait for homogeneous predicates. If the input requirements are not met by the candidates, coercion comes into play: the inputs are reinterpreted in such a way that they do satisfy the requirements. If the requirements are satisfied, the tense operators can apply. On this account, the interpretations that we find with the Passé Simple and Imparfait (see Section 2) are the result of a coercion process.

A comparison to the English Progressive might clarify the difference between an aspectual operator and a coercion approach: on an aspectual operator approach, the shifts that we find with the perfective and imperfective are comparable with

the shift that is *inherently* associated with the Progressive (from events to states), whereas on a coercion approach these shifts are comparable with the *reinterpretation of the input* (from states to events) that occurs when the predicate-argument structure is stative.

De Swart is the most explicit defender of this view on the Passé Simple and Imparfait, but we find it also in some of the work by Hans Kamp.[7]

What are the reasons to analyze the Passé Simple and Imparfait as aspectually sensitive tense operators rather than aspectual operators? De Swart gives five arguments which I will discuss in turn.

The first reason is the *restriction to the past tense*. The Passé Simple and Imparfait only occur in the past tense. This is in contrast to, for example, the English Progressive, which can be combined with past, present and future tense. If one analyzes the Passé Simple and the Imparfait as aspectual operators, one has to look for an explanation of this restriction, whereas it follows naturally from an analysis in terms of aspectually sensitive *past* tense operators.

Secondly, within the forms of the Passé Simple and Imparfait there are *no distinct morphemes* for tense and aspect, but temporal and aspectual information are encoded in a single morpheme.

Thirdly, if they were aspectual operators, the Imparfait and Passé Simple would in many cases apply *vacuously*: for the Imparfait this would hold if its input

7. Kamp discusses this view most explicitly in an unpublished research report on French from the nineties, Kamp (1992: 45): "As temporal operators PS [Passé Simple] and Imp [Imparfait] coincide; both indicate that the episode described lies somewhere in the past of the utterances time. But as aspectual operators they are diametrically opposed, as VPs in the Imp always have a "stative" and those in the PS always have a "non-stative" interpretation. The circumstance that PS and Imp always put their aspectual signature on the VPs to which they are applied has important implications. It means that when these tenses combine with verb phrases of a different aspectual signature the result will be a VP with a different aspectual status, and therefore one whose meaning differs from that of the underlying untensed VP. The interpretation which is needed when the aspectual signatures of tensed and untensed VP clash is reminiscent of what we have said above about progressives such as *is being funny* – with the proviso that in the case of PS and Imp the need for reinterpretation arises when the aspectual class of the untensed VP does *not* agree with that of the result of applying the tense, whereas the progressive necessitates reinterpretation precisely when there is agreement (i.e. when the underlying VP is itself a stative). While reinterpretation is necessary both when a PS applies to a stative VP and when the Imp applies to a non-stative one, the reinterpretation strategies are quite different in the two cases." That Kamp has a coercion analysis in mind can be concluded from the fact that he compares the aspectual shifts that we find with the Passé Simple and Imparfait with the *coercion* shift that the Progressive provokes with stative expressions (from stative to eventive), rather than with the shift that is *inherently* associated with the Progressive (from eventive to stative).

is already homogeneous, and for the Passé Simple if its input is already quantized. According to de Swart, for reasons of economy, a language would use a neutral form in these cases rather than an aspectually marked form. On an analysis as aspectually sensitive tense operators, the Imparfait and Passé Simple never apply vacuously: they always map an eventuality onto the time axis.

Fourthly, if one analyzes both duration adverbials and grammatical aspect as aspectual operators, one may expect *scope ambiguities* to arise. De Swart claims that such scope ambiguities do not occur with the Passé Simple or the Imparfait, which always take scope over duration adverbials. An analysis of the Passé Simple and Imparfait as tense operators predicts this if one assumes the structure in (16).

Finally, in contrast to the Progressive in English, neither the Passé Simple nor the Imparfait specifies *one particular aspectual transition*. As we have seen in Section 2, the Passé Simple can have an ingressive or complexive interpretation, and the Imparfait a habitual or progressive interpretation. At least intuitively, this fits well with a coercion analysis: the mismatch *somehow* has to be solved, and it might be that there is more than one way in which this can be done.

We have seen in Section 2 that the interpretations we get with the Ancient Greek Aorist are the same as the ones we find with the French Passé Simple, and that the same holds for the Imperfective and Imparfait. In the next section I will discuss the questions (i) whether the coercion approach can be applied to Ancient Greek and (ii) which approach is preferable from a cross-linguistic perspective.

3.3 Evaluation of the two options

In the previous section, I discussed two ways in which the initial analysis presented in Section 3.1 can be worked out in more detail. In this section, I evaluate these two approaches. The evaluation proceeds by means of a comparison of the applicability of either approach to the aspectual systems of French and Ancient Greek.

Let us consider whether the coercion approach can be applied to Ancient Greek. The answer to this question is in the negative, the reason for this being that the Imperfective and Aorist differ from the Imparfait and Passé Simple in some crucial respects. The first respect concerns the first argument de Swart puts forward in favor of a coercion analysis for French, the restriction to the past tense. In Ancient Greek the perfective/imperfective distinction is not restricted to the past tense. On the contrary, it is grammaticalized throughout the verb paradigm. Although in the indicative the distinction is largely restricted to the past tense,[8]

8. We do find this distinction in non-past tenses of the indicative as well. Kühner and Gerth (1898: 154,177) note that there are distinct forms for aoristic and imperfective aspect in the passive forms of the future tense.

outside the indicative, there are special forms for the Aorist and the Imperfective in every mood (optative, subjunctive, imperative) as well as in the participle and infinitive. This is illustrated in Table 1 for the verb *luein* ('to release').

Table 1. The perfective/imperfective distinction in Ancient Greek

		Imperfective	**Aorist**
finite	indicative (past tense)	*eluon*	*elusa*
	subjunctive	*luō*	*lusō*
	optative	*luoimi*	*lusaimi*
	imperative	*lue*	*luson*
nonfinite	participle	*luōn*	*lusas*
	infinitive	*luein*	*lusai*

This property of the Ancient Greek aspectual system makes it impossible to analyze the Aorist and Imperfective as aspectually sensitive past tense operators, as this could only work for the Aorist and Imperfective in past tense of the indicative. In all other verb forms no temporal contribution is made, whereas we do find distinct perfective and imperfective forms.

One might propose a variant of de Swart's (1998) proposal that sticks with the idea of coercion but without explicating it in terms of *tense* operators. For example, the subjunctive of the Aorist could be analyzed as an aspectually sensitive modal operator rather than as a combination of an aspectual operator and a modal operator. And likewise, the optative of the Aorist could be analyzed as a different modal operator with the same aspectual sensitivity rather than as the combination of the same aspectual operator with a different modal operator. Such a move, however, would obscure the aspectual contribution unnecessarily.[9]

A coercion analysis cannot be applied to Ancient Greek because it has special forms for the perfective and imperfective throughout the verb paradigm. But Ancient Greek is by no means the only language in which the perfective/imperfective distinction is grammaticalized throughout the verb paradigm. Other languages are, for example, Slavic languages and Modern Greek. For all such languages an

9. Yet another option would be to analyze the Aorist and Imperfective as aspectually sensitive vacuous operators (operators that only select for predicate of a particular class) rather than aspectual operators. The problem then is that Aorist and Imperfective morphology end up semantically empty: the meaning effects that we find are attributed to a coercion operator, which, by definition, is not the meaning of a particular morpheme itself. (Note that this wouldn't be a serious option for de Swart either, as her objection to operators that are sometimes vacuous can be expected to extend to operators that are always vacuous.)

analysis of the perfective and imperfective in terms of aspectually sensitive tense operators faces the same problem as presented above for Ancient Greek.

What makes an analysis that conflates the aspectual and temporal contribution in one operator, such as the analysis in terms of aspectually sensitive tense operators, even less attractive for Ancient Greek is that this language has clearly dinstinct morphemes for tense and aspect. The morpheme for past tense is the augment *e* prefixed to the verb stem. The past tense morpheme is obligatory in all past tenses and only in past tenses. It occurs in combination with all grammatical aspects: with the past tense of the Imperfective, with the past tense of the Aorist, and with the past tense of the Perfect. The morpheme is absent in the non-past tenses of the indicative, in the non-indicative finite forms and in the non-finite forms. As for aspect, for different verbs, there are different ways in which the Imperfective-Aorist opposition can be morphologically realized, but whatever the realization is, it is the same throughout the verb paradigm. In this respect too, Ancient Greek differs from French. De Swart's second argument in favor of a coercion analysis was that within the forms of the Passé Simple and Imparfait there are no distinct morphemes for tense and aspect. The existence of clearly distinct morphemes for tense and for aspect in Ancient Greek runs counter to an analysis which conflates the two, such as the analysis in terms of aspectually sensitive tense operators, because if the semantic effect of choosing either the Aorist or the Imperfective would be attributed to class restrictions from other sources, Aorist and Imperfective morphology would end up semantically empty. This makes it attractive to develop an analysis in which each has its own semantic contribution, such as an aspectual operator approach.

What about the other three arguments de Swart gave in favor of an analysis of the Passé Simple and Imparfait as aspectually sensitive tense operators? Do these hold for Ancient Greek as well? I will show that Ancient Greek behaves the same as French in these respects.

The third point concerned the existence of vacuous operators that one has to assume on an analysis of the perfective and imperfective in terms of aspectual operators. As in French, if the input of the Aorist is already quantized, the Aorist makes no semantic contribution and the same with the Imperfective if its input is already homogeneous. Hence, for Ancient Greek too, we would have to allow for operators that sometimes apply vacuously. The fourth point was the lack of scope ambiguities. There are reasons to believe that in Ancient Greek too the Aorist and Imperfective have scope over duration adverbials. And finally, there was the point of the several interpretations. As we saw in Section 2, as in French, we find two interpretations associated with the Aorist and two with the Imperfective.

The fact that Ancient Greek behaves the same as French in these three respects means that if these points are indeed arguments in favor of a coercion approach

and objections to an aspectual operator approach for French, the same holds for Ancient Greek. But are they really arguments in favor of the former and against the latter?

The third point concerning vacuous operators isn't. The phenomenon that a morpheme is overtly expressed although it makes no semantic contribution is quite common in language. A case in point is (18):

(18) Yesterday, John baked a cake.

The contribution of the past tense is superfluous due to the presence of the adverb *yesterday*, but it is still there.

The fourth point, the absense of scope ambiguities with duration adverbials, can be accounted for more elegantly on an analysis in terms of aspectually senstive tense operators, but, on an analysis as aspectual operators, it is, of course, very well possible to formulate a rule which always gives grammatical aspect scope over duration adverbials. The disadvantage is just that such a rule would be *ad hoc* whereas the right scope follows automatically from the aspectually sensitive tense operator approach.

The last point, the fact that the perfective and the imperfective both have more than one interpretation, is the most compelling argument in favor of a coercion analysis. To give an explanation for this is the main challenge for an aspectual operator analysis. Before I go into the question whether an aspectual operator analysis can deal with this, Table 2 first gives an overview of the results up to now.[10]

Table 2. Preliminary evaluation of the aspectual operator and the coercion approach

	Aspectual operator		**Coercion**	
	French	**AG**	**French**	**AG**
distribution through paradigm	±	+	+	– –
morphology	±	+	+	–
scope ambiguity	±	±	+	+
several interpretations	?	?	+	+

10. + indicates that the point in question is an argument in favor of the approach; ± that it is neither a pro nor a con (for example, the right scope doesn't follow automatically on the aspectual operator approach, but it can be dealt with if a rule is added that does the trick); – indicates that it is a problem; – – indicates that it is a problem that can in no way be fixed. ? indicates that discussion of this point is postponed. The point of the vacuous operators is not included, as I don't consider this an argument in favor of either approach.

We see that the first two arguments in favor of a coercion approach are based on French in particular and do not hold for Ancient Greek, and that the last two have to do with properties of the perfective/imperfective distinction in general rather than with the French Passé Simple and Imparfait in particular.

The distribution throughout the paradigm is a crucial argument against a coercion approach for Ancient Greek. The aspectual operator approach, on the other hand, should find a way to deal with the several interpretations of the perfective and the imperfective. Let us now discuss two suboptions within the aspectual operator approach in order to see what possibilities such an approach has in this respect.

The first suboption within the aspectual operator approach would be to say that there is one function corresponding to the perfective and one to the imperfective. On this *function* option, however, it would be unclear how we can account for the fact that both the perfective and the imperfective have several interpretations, as the output of a function is uniquely determined by its input.

Another possibility would be to say that it is merely a constraint that the output of the perfective is quantized predicate and the output of the imperfective a homogeneous predicate. I will call this the *constraint* option. On this account, it may very well be that there is more than one function corresponding to the imperfective and more than one corresponding to the perfective, but what they have in common is that the output is a homogeneous respectively quantized predicate. For the perfective, for example, we could explain the data by assuming an ambiguity between a maximality operator MAX for the interpretation of completion and an ingressive operator INGR for the ingressive interpretation.

(19) MAX: $\lambda P \lambda e(P(e) \wedge \forall e'(e \sqsubset e' \rightarrow \neg P(e')))$

(20) INGR: $\lambda P \lambda e \exists t(\tau(e) = IB(t) \wedge \exists e'(\tau(e') = t \wedge P(e') \wedge \neg \exists t'(t \subset t' \wedge \exists e''(t' = \tau(e'') \wedge P(e'')))))$[11]

MAX, based on Krifka's (1989b) AOR, maps the set of eventualities in the extension of a predicate P on the set of locally maximal eventualities in the extension of P.[12] In this way, reference is made to the complete eventuality, from beginning to end. INGR(P) is true of an eventuality e iff the run time of e is the initial bound (IB) of an interval t at which a P eventuality e' holds, and t is not a part of a larger

11. Dowty (1979: 140) defines the initial bound (IB) for an interval as follows: i is an initial bound for an interval I iff $i \notin I$ and $[i]$ is an initial subinterval for $\{i\} \cup I$ (that is, i is the latest moment just before I).

12. Here I gloss over the complication with non-convex eventualities, see Krifka (1989b: 179–180).

interval *t′* at which a *P* eventuality *e″* holds. Reference is made to the beginning of a *P* eventuality. Both MAX and INGR return quantized predicates.

Unfortunately, the constraint option has its own problem. One of the nice points of the picture I sketched in 3.1 was that it could explain that we find the ingressive interpretation of the perfective only with unbounded (=homogeneous) predicate-argument structures. For, if the perfective makes its input quantized, we find a semantic contribution (special interpretation) of the perfective if and only if its input is not yet quantized. This nice point is lost on the constraint option. Whereas MAX is the identity mapping for quantized predicates, INGR isn't: it makes a contribution with both homogeneous and quantized predicates. Whereas this option rightly predicts that if its input is homogeneous there *must* be a special interpretation, it wrongly predicts that if the input is quantized there *can* be a special interpretation.

A coercion approach does not suffer from this problem. It predicts that we find special interpretations only in case of a mismatch between the requirements of the operator and the aspectual class of the argument. That is, it rightly predicts that if the input of the perfective is already quantized, we don't get an ingressive interpretation. But whereas the coercion approach gives the right prediction for the ingressive interpretation of the perfective, it predicts that the habitual interpretation of the imperfective too would occur only in case of a mismatch, that is, with a quantized input. This prediction is not borne out. In (21) and (22) we can see that we find the habitual interpretation of the imperfective also with homogeneous predicate-argument structures, such as *I sleep* and *they carry long spears*.

(21) *Quand j'* étais *petit, je ne* dormais *pas bien.*
When I be.IMP young I not sleep.IMP not well
"When I was young I didn't sleep well."

(22) *Ēn de touton ton chronon ethnos ouden en tēi*
be.IMP PRT that.ACC the.ACC time.ACC nation.NOM no.NOM in the.DAT
Asiēi oute andrēioteron oute alkimōteron tou
Asia.dat nor more.courageous.NOM nor braver.NOM the.GEN
Ludiou. Hē de machē spheōn ēn ap' hippōn
Lydian.GEN the.NOM PRT battle.NOM they.GEN be.IMP from horse.GEN
dorata te ephoreon *megala kai autoi ēsan*
spear.ACC PRT carry.IMP. long.ACC and they.NOM be.IMP
hippeuesthai agathoi
manage.horse.INF.IMP good.NOM
"Now at this time there was no nation in Asia more courageous or braver than the Lydian. They fought on horseback, carried long spears, and they were skillful at managing horses."

(Herodotus, *Histories*, 1.79)

The results of the evaluation of the three options are summarized in Table 3.

Table 3. Final evaluation of the aspectual operator and the coercion approach

	Aspectual operator				Coercion	
	Function		Constraint			
	French	AG	French	AG	French	AG
distribution through paradigm	±	+	±	+	+	– –
morphology	±	+	±	+	+	–
scope ambiguity	±	±	±	±	+	+
several interpretations	–	–	+	+	+	+
distribution ingressive	+	+	–	–	+	+
distribution habitual	–	–	+	+	–	–

The conclusions can be read from Table 3: the coercion approach cannot work for Ancient Greek, nor for other languages in which the perfective/imperfective distinction is grammaticalized throughout the verb paradigm. Furthermore, it cannot account for the distribution of the habitual interpretation of the imperfective. The two suboptions of the aspectual operator approach both have their own problem: on the function option it is not clear how the variety in interpretation could be dealt with; on the constraint option the restriction of the ingressive interpretation to homogeneous predicates should be explained. Future research is needed to see the problems of which suboption are more easily solved.

4. Conclusion

In this paper I investigated whether a coercion approach or an aspectual operator approach of the perfective/imperfective distinction is preferable from a cross-linguistic perspective. The defense of the latter is based on the similarities and differences between the aspectual systems of French and Ancient Greek.

We have seen that there are many similarities between the Passé Simple and the Aorist and between the Imparfait and the Imperfective. This makes it attractive to give a uniform account of the perfective/imperfective distinction in the two languages at the points they share.

I followed the idea proposed by some authors (Mourelatos 1981; Bach 1986; and de Swart 1998) that the perfective/imperfective distinction is the distinction between quantized and homogeneous predicates. After having given the rough sketch of this idea, I discussed two ways in which the proposal can be worked out: the aspectual operator approach and the coercion approach.

The most compelling argument in favor of a coercion analysis, the fact that there is more than one interpretation associated with the perfective and with the imperfective, does not concern a property that is special to the French Passé Simple and Imparfait, but is typical for the perfective/imperfective distinction in general. Therefore, an analysis that can handle this point, should not exclusively work for French, but for all languages with the perfective/imperfective distinction. I showed that a coercion approach of the perfective/imperfective distinction cannot be made to work for languages that, like Ancient Greek, have special forms for the perfective and imperfective throughout the verb paradigm and in which aspect and tense is encoded in distinct morphemes.

Apart from these cross-linguistic considerations, the coercion analysis is problematic for French, too, as it wrongly predicts that the habitual interpretation of the imperfective occurs only with quantized predicate-argument structures.

An aspectual operator approach is superior from a cross-linguistic perspective, as it is able to give a uniform account of both languages that behave like French and languages that behave like Ancient Greek. Nevertheless, we saw that the aspectual operator approach needs further research in order to solve some problems, too.

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Lexical and compositional factors in the aspectual system of Adyghe*

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This paper deals with different components of aspectual interpretation in Adyghe, a polysynthetic North-West Caucasian language, and hierarchical relations among them. Following Tatevosov (2002), I propose a classification of Adyghe predicates into actional classes, and then show how this classification can account for the distribution of temporal adverbials. I argue that temporal adverbials in Adyghe are able to shift the lexically specified actional characteristic of the predicate (coercion in the sense of de Swart 1998) and thus constitute a separate level of aspectually relevant operators intermediate between lexical and grammatical aspect.

1. Introduction

This paper will focus on the interaction and resolution of different factors which contribute to the aspectual interpretation of phrases and sentences, exemplified by data from Adyghe (also known as West Circassian), a polysynthetic North-West Caucasian language spoken in Russia and in Turkey (existing sources on Adyghe include Paris 1989; Smeets 1984; Rogava & Kerasheva 1962; Kumakhov 1971). More specifically, I will argue that in order to accurately and adequately characterize aspect in Adyghe it is necessary to regard temporal adverbials as a separate layer of aspectually relevant operators with its own combinatorial properties and

*The data presented in this paper comes mainly from the author's fieldwork materials collected in 2004–2005 during field-trips to village HaqweRinehabl, Republic Adygeya (Russian Federation), organized by the Russian State University for the Humanities. The funding for the research was provided mainly by the Russian Foundation for the Humanities, grants Nos. 04-04-18008e and 06-04-00194a, and also by the Russian Science Support Foundation, and by the Section of History and Philology of the Russian Academy of Sciences.

The author wishes to express his gratitude to Dmitry Gerasimov, Helen de Hoop, Natalia Korotkova, Yury Lander, Barbara Partee, Anna Pazelskaja, Andrej Shluinsky, Nina Sumbatova, Sergej Tatevosov, Yakov Testelets, and two anonymous reviewers, from whom this paper benefited directly or indirectly, and, last but not least, to all his Adyghe consultants.

restrictions, which are not reducible to inherent actional properties of predicates (cf. similar proposals in Depraetere 1991, 1995; Klein 1994; Smith 1995; de Swart 1998, 2000; Bertinetto & Delfitto 2000, and especially Güven 2004, 2006). Primary attention in this paper will be paid to empirical arguments in favour of a treatment of the Adyghe aspectual system which assumes a minimally tripartite distinction among (i) the lexically specified aspectual nature of predicates, (ii) semantic and combinatory properties of temporal adverbials, and (iii) grammaticalized viewpoint aspect, all of which contribute their own information pertinent to the aspectual interpretation of sentences, and to the refinement of a non-aprioristic typological approach to lexical and grammatical aspectuality developed by Tatevosov (2002). This paper does not propose any particular formal framework for such an analysis; that must be the subject of a separate discussion.

The paper is structured as follows. In Section 2 I will briefly outline the theoretical and methodological preliminaries of this study, focusing on the discovery procedure of actional classes proposed by Tatevosov. In Section 3 I will give a characterization of the system of tense-aspect categories of Adyghe, and in Section 4 I will turn to the system of actional classes of this language. Section 5 will present the data on the interaction of Adyghe predicates belonging to different actional classes with temporal adverbials, and outline two possible accounts of this material, which I call 'lexical' and 'compositional'. In Section 6 further data will be discussed, which, as I will argue, points towards the 'compositional' analysis. Section 7 will briefly discuss some theoretical and typological implications of the material presented in the preceding sections.

2. A layered theory of aspectuality

It is commonly assumed by the proponents of the so-called 'bidimensional' theories of aspect (e.g. Smith 1997/1991; Filip 1999; Bertinetto & Delfitto 2000) that it is necessary to distinguish between 'inner aspectuality' (*eventuality type, lexical* or *situational aspect*) and 'outer aspectuality' (*viewpoint, 'grammatical' aspect*). It is also widely acknowledged that both types of aspectual information are not elementary, and consist of several interconnected components; e.g. 'inner' aspectuality is determined not only by the inherent lexico-semantic features of the verb itself, but also by the semantic and referential properties of its arguments (this phenomenon is known by the name *aspectual composition*, see inter alia Krifka 1989, 1992, 1998; Verkuyl 1972, 1989, 1993, 2005; Tenny 1994; Filip 1999).

By *actionality* I understand (following Tatevosov 2002) those components of the lexical meaning of the predicate which reflect the temporal and causal structure of the event it describes, i.e. stativity vs. dynamicity, telicity vs. atelicity etc. This means

that the term 'actionality' only refers to a subset (although the core one) of the semantic factors relevant to the more general domain of 'inner' aspectuality. Other components of the 'situational' aspect interact with actionality of verbs in different but principled ways. A more precise definition of actionality will be given below.

Turning to aspectual viewpoint, two such viewpoints are traditionally distinguished: the *imperfective* vs. the *perfective*,[1] which differ as to the perspective the speaker imposes upon the situation denoted by the predicate (cf. Comrie 1976; Dahl 1985; Klein 1994; Paducheva 1995). The imperfective viewpoint entails an *internal* or *synchronic* perspective on the situation, which is presented as ongoing and without regard to its boundaries. By contrast, the perfective viewpoint imposes an *external* point of view, whereby the situation is seen in its entirety as having boundaries (be they inherent, as with telic predicates like *write a letter*, or arbitrary, as with atelic predicates like *walk*). Using a common metaphor, the imperfective viewpoint allows the speaker to refer to the internal structure of the situation, whereas the perfective aspect does not.

It is important to underscore that both components of aspect are universal in the following sense: all human languages are able to describe different extralinguistic situations as static or dynamic, telic or atelic, as well as to impose upon them one of the two viewpoints — despite the fact that the ways these notions are applied and encoded are subject to considerable cross-linguistic variation (cf. Csirmaz 2004).

Certainly, the two components of the domain of aspect I have just outlined do not exhaust the range of aspectually relevant semantic features; for instance, the whole variety of meanings that belong to the so-called 'quantificational' aspect (cf. Dressler 1968; Cusic 1981; Khrakovskij (ed.) 1997) have been left out; they constitute an important separate layer (or, probably, several layers) of aspectual meanings, which interact in a complex way with both actionality and viewpoint. The way these meaningful features are represented in the grammatical and lexical structure of Adyghe is still not clear and requires further research, therefore these issues will not be touched upon here.

Turning back to actionality, it is assumed, as I have already mentioned, to be universally available to human languages on a par with the aspectual viewpoint. Now it is necessary to clarify in which sense actional notions are cross-linguistically valid. As is more or less evident under the current state of the art, Vendler's classical quadripartition of situations into *states*, *activities*, *accomplishments* and *achievements*, as well as a whole variety of refinements proposed by different authors during the

1. Smith (1997/1991) argues for a third viewpoint which she terms 'neutral'. See, however, Csirmaz (2004) for counterarguments.

last three decades (cf. Dowty 1979; Mourelatos 1981; Smith 1997/1991; Verkuyl 1972, 1989, 1993; Bach 1986; Klein 1994; Breu 1994; Olsen 1997; Filip 1999), are not universal (cf. Ebert 1995; Johanson 1996; Tatevosov 2002; Botne 2003). Languages vary not only in that they often assign verbs with similar meanings to different actional classes, but also — and more importantly — in their whole actional systems (see especially Tatevosov 2002). This, however, by no means implies that actional meanings show no cross-linguistic consistency and do not allow typological comparison; that they vary across languages is merely an indication that linguists need more refined methods for their study.

Since actional classes are not identical in different languages, a universal system of notions is necessary which could describe them in a way that allows cross-linguistic comparison, coupled with an empirical procedure to help in the identification of actional classes in any given language. A theory of actionality which incorporates both features in question has been proposed in Tatevosov 2002. Below I will give a brief description of it (for a detailed discussion see Tatevosov 2002).

Tatevosov's theory of actionality assumes that all actional classes in human languages are composed of *universal elementary actional meanings* which constitute a small closed set of semantic primitives.[2] The universal elementary actional meanings are *state* (S; 'sleep', 'know John'), *process* (P; 'work', 'walk in the park'), *multiplicative process* (M; 'cough', 'twinkle'), *entry-into-a-state* (ES; 'fall', 'write a letter'), *entry-into-a-process* (EP; 'start running'), *quantum* of a multiplicative process (Q; 'give a cough').[3] Among the six elementary actional meanings it is useful to distinguish between *durative* (S, P, M) and *instantaneous* ones (ES, EP, Q); the latter correspond to transitions of Pustejovsky (1991).

The method proposed by Tatevosov crucially hinges on the elementary actional meanings and the universal aspectual viewpoints. Let us call *Ipf* the set of elementary actional meanings a verb V (in a language L) is able to express in combination with the imperfective aspectual viewpoint, and *Pf* the set of actional meanings which V is able to express when combined with the perfective viewpoint. Both sets may contain more than one element, and, moreover, Ipf may be empty (as e.g. with

2. This set, however, is not wholly aprioristic: the meanings which are assumed to belong to it have proved to be necessary for the description of actionality in several languages; moreover, in case cross-linguistic research shows that more elementary actional meanings are necessary, the set will be augmented accordingly.

3. This actional meaning was not used in the original paper by Tatevosov, who identified it with ES; I have introduced it mainly for reasons of conceptual symmetry.

the English verb *find*). Then the *actional characteristic* of V is defined as the pair ⟨Ipf, Pf⟩. We may now define *actional class* as a set of verbs with identical actional characteristics. In order for the actional classification of verbs in a given language to be representative, the sample of verbs whose actional characteristics are studied has to be sufficiently large (no less than a hundred lexemes) and include predicates of different semantic classes.[4]

Cross-linguistic research on actionality (some of its results are presented in Tatevosov 2002) has shown that the empirical procedure just outlined is a useful and effective method which allows one not only to discover actional classes in a given language in a non-aprioristic fashion, but also to compare actional classes across languages. Such a comparison has shown that among quite a large variety of actional classes attested in particular languages there is a number of classes which consistently recur in one language after another, the so-called *cross-linguistic actional classes* (see Table 1).[5] What is most important about Table 1 is that it clearly shows that the set of cross-linguistic actional classes identified so far differs in important ways from the set of Vendlerian classes.[6] Indeed, *Stative*, *Processual* and *Punctual* classes more or less correspond, respectively, to Vendler's *states*, *activities* and *achievements*, but Vendler's *accomplishments* are further subdivided into *Weak* and *Strong Telic* classes, whereas *Inceptive-Stative* and *Ingressive-Processual* classes have no corresponding Vendlerian classes at all.

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4. "In the present study of actionality ⟨…⟩ I use a sample of 100 predicative meanings of the following thematic groups: being and possession; motion; physical processes and changes; physiological states and processes; labor and everyday life; speech and sound production; perception, emotions, and intellectual activity; phasal and modal verbs." (Tatevosov 2002: 358). For a more detailed discussion of how actional characteristics of verbs are determined, see the same article.

5. Needless to say, it is not the case that *any* language must have *all* cross-linguistic actional classes; however, a weaker hypothesis that in any language at least *some* of such classes will be attested, seems to hold.

6. An anonymous reviewer has pointed out to me the possibility of treating such actional classes as e.g. Weak Inceptive-Stative as ambiguous between the classical Vendlerian *states* and *achievements*, without multiplying the number of actional distinctions. Possible though such an account may be, it is, in my opinion, by no means superior to the one proposed by Tatevosov and advocated in this paper. Indeed, if we postulate that verbs in particular languages and, more importantly, cross-linguistically, may show systematic actional ambiguities, we still have to somehow differentiate 'actionally ambiguous' verbs from 'actionally unambiguous' ones. What is crucial, however, is not the particular notational or terminological variant of an actional classification, but the empirical and theoretical necessity to distinguish more aspectual types of verbs than it was originally suggested by Vendler.

Table 1. Cross-linguistic actional classes (following Tatevosov 2002: 376)

Actional class	*Actional characteristic*
Stative	⟨*S, S*⟩
Processual[7]	⟨*P, P*⟩
Strong Telic	⟨*P, ES*⟩
Weak Telic	⟨*P, {ES, P}*⟩
Punctual	⟨*–, ES*⟩
Strong Inceptive-Stative	⟨*S, ES*⟩
Weak Inceptive-Stative	⟨*S, {ES, S}*⟩
Strong Ingressive-Processual	⟨*P, EP*⟩
Weak Ingressive-Processual	⟨*P, {EP, P}*⟩
Strong Multiplicative[8]	⟨*M, Q*⟩
Weak Multiplicative	⟨*M, {Q, M}*⟩

The typological research on actionality, despite some important results already attained, is only in its initial phase, and it is so far premature to draw generalizations about possible types of actional systems. This paper presents the results of applying Tatevosov's procedure to Adyghe, and presents data which support the theoretical and methodological premises of this particular conception of actionality.

3. Tense and aspect in Adyghe

Adyghe is a polysynthetic language with very complex verbal morphology.[9] Besides a powerful system of bound pronominals, which is able by itself to encode up to three clausal participants, there is a rich and extremely complex system of derivations which affect the valency of a predicate, and a whole array of locational preverbs with sometimes quite unexpected meanings. In terms of Bhat (1999), Adyghe is most probably a 'mood-prominent' language; it has a multi-layered

7. I prefer this term to Tatevosov's *atelic*.

8. This class is not identified by Tatevosov as a cross-linguistic actional class; subsequent research has shown that this class may be considered such on a par with the Weak Multiplicative class.

9. It is necessary to bear in mind that the distinction between nouns and verbs is almost vanishing in Adyghe (see Lander & Testelets 2006 for discussion); almost any content word may appear in the predicate position and bear TAM morphology as well as occur in the argument position and combine with case markers. So, the very use of the terms 'verb' and 'verbal' with reference to Adyghe data is somewhat misleading.

system of affixes encoding different kinds of modality (both root and epistemic), which interacts, on the one hand, with the encoding of tense (for instance the same suffix *-šʼt* serves as a general irrealis marker and fulfils the function of the neutral future tense) and, on the other, with the system of non-finite forms used in sentential complements and adverbial subordinate clauses (cf. Gerasimov (2006) for a brief discussion of Adyghe, and Kumakhov and Vamling (1995, 1998) for a detailed discussion of the closely related Kabardian).

By contrast, the morphological tense-aspect categories in Adyghe are rather straightforward and simple. There is a tripartite system similar to those attested in many European languages and generally all over the world (cf. Dahl 1985). It consists of a general Present tense and two tenses with past time reference: the Preterite and the Imperfect.

The Present tense, which has no overt marker with the so called 'static' predicates, and is expressed by the prefix *me-/ma-/-e-* with the so called 'dynamic' predicates,[10] has a whole range of meanings, such as durative, see example (1), progressive, see example (2a), habitual, see example (2b), and generic, see example (3).[11]

(1) *čʼale-r šʼə-t.*
boy-ABS LOC-stand
'The boy is standing.' (= is now in an upright position)

(2) a. *pŝaŝe-r ǯʼədede txələ-m j-e-ǯʼe.*
girl-ABS now book-OBL 3SG.IO-PRS-read[12]
'The girl is now reading the book.'

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10. The verbal lexicon in Adyghe is divided into two major subclasses which are called 'static' and 'dynamic'. This dichotomy, which is common to all languages of the North-West-Caucasian stock (see Hewitt 2005), is a morphosyntactic distinction rather than a semantic one. All morphologically 'static' verbs are indeed semantically stative, but by no means all semantically stative verbs are morphologically 'static'. The majority of 'static' verbs are 'denominal', i.e. when a noun is put into the predicate position it by default assumes the morphological properties of a 'static' verb. The difference between 'static' and 'dynamic' predicates is most clearly observed in the Present tense, where 'dynamic' predicates have a prefix *me-* (*ma-*) or *-e-*, while 'static' predicates bear no overt marking. Some predicates allow both 'static' and 'dynamic' morphology (with semantic differences which partly follow from the lexical semantics of the predicate), e.g. *bzaǯʼe* means 'is a rascal' (as an individual-level property) while *me-bzaǯʼe* means 'is being naughty now'.

11. This example is due to Natalia Korotkova.

12. Adyghe is in general a morphologically ergative language both in dependent marking (case on argument NPs) and head marking (pronominal affixes on predicates), but many two-argument predicates in this language are morphosyntactically intransitive. Their subject is

b. *pŝaŝe-r mafe qes txələ-m j-e-ǯ'e.*
girl-ABS day every book-OBL 3SG.IO-PRS-read
'The girl every day reads the book.'

(3) *čəg$_w$ə-r təʁe-r χ$_w$əraj-ew q-e-k$_w$əhe.*
earth-ABS sun-ABS go.around-ADV DIR-PRS-travel
'The Earth goes around the Sun.'

The Preterite (suffix *-ʁe*) expresses perfective viewpoint in the past, with both terminative (4) and delimititative (5) interpretations:

(4) *pŝaŝe-r txələ-m je-ǯ'a-ʁ.*
girl-ABS book-OBL 3SG.IO-read-PST
'The girl read the book (to the end).'

(5) *č'ale-r telewizorə-m je-pλə-ʁ.*
boy-ABS television-OBL 3SG.IO-watch-PST
'The boy watched television (for some time).'

Finally, the Imperfect (suffix *-š'təʁe*)[13] has a set of interpretations which includes Durative/Progressive-in-the-Past (6a) and Habitual-in-the-Past (6b).

(6) a. *wəne-m sə-z-je-he-m č'ale-r pŝaŝe-m de-g$_w$əš'ə?e-š'təʁ.*
room-OBL 1SG.S-SBD-LOC-go-OBL boy-ABS girl-OBL SOC-talk-IPF
'When I entered the room, the boy was talking with the girl.'

b. *č'ale-r səhat-jə-ble čəje-š'təʁe.*
boy-ABS hour-INF-seven sleep-IPF
'The boy used to sleep for seven hours (every day).'

---

marked by the Absolutive case (suffix *-r*), and their object receives the Oblique case (suffix *-m*), which is used both for transitive subjects (A) and indirect objects and even for some locative phrases. To this large class of two-argument intransitive predicates belong quite a lot of verbs which in more familiar languages are treated as transitive agent-patient verbs, e.g. *hit*, *read* etc. The distribution of two-argument predicates between morphosyntactically transitive and intransitive classes is partially semantically driven (see Testelets 1998 and Malchukov 2005 for a cross-linguistic discussion), but is to a large extent lexicalized and arbitrary (cf. the following pair: transitive *šxen* 'eat' and intransitive *jəŝ$_w$en* 'drink'). What is important for our purposes is that the way arguments of a two-argument predicate are encoded in most cases does not correlate with its actional properties: the intransitive verb *jeǯ'en* 'read' is an ordinary telic verb, just as the transitive *txən* 'write'.

13. Superficially, this suffix looks like a combination of the Irrealis suffix *-š't* with the Preterite suffix *-ʁe*. Nevertheless, the Imperfect marker does not behave as a combination of these two even in its morphophonological properties, let alone its semantics. It is probable, however, that both the Irrealis marker and the Imperfect go back to the same lexical item *š'ə-t-* 'stand' (with the most general locational preverb) which went through two different paths of grammaticalization. Some formal properties of the Imperfect forms point towards their originating from a complex predicate formed by the stem of the lexical verb and the Preterite form of the auxiliary.

The range of interpretations available to particular combinations of predicates with tense-aspect forms are restricted by the actional properties of the predicates, to which we now turn.

4. Actional classes in Adyghe

In order to determine the system of actional classes of predicates present in Adyghe, the empirical procedure outlined in Section 2 was applied. The Present in its durative/progressive interpretation and the Preterite were used as the diagnostic forms for Ipf and Pf, respectively; the sample of predicates surveyed includes 130 lexemes from various semantic fields. The resulting system of actional classes is shown in Table 2.

Table 2. Actional classes in Adyghe

Class	*Ipf*	*Pf*	*No. of predicates*	*Examples*
Stative	*S*	*S*	*32*	*šʼələn ‘lie’, psewən ‘live’*
Strong Inceptive-Stative	*S*	*ES*	*10*	*ṣen ‘know’, λeʁ$_w$ən ‘see’*
Weak Inceptive-Stative	*S*	*ES,S*	*1*	*čəjen ‘sleep’*
Processual	*P*	*P*	*15*	*ǯʲeg$_w$ən ‘play’, txen ‘write’ (intransitive)*
Strong Ingressive-Processual	*P*	*EP*	*4*	*k$_w$en ‘go’, bəbən ‘fly’*
Strong Multiplicative	*M*	*Q*	*10*	*k$_w$əwen ‘shout’, wəẑ$_w$əntxen ‘spit’*
Weak Multiplicative	*M*	*Q,M*	*1*	*psken ‘cough’*
Punctual	—	*ES*	*8*	*ʒən ‘throw’, qewen ‘explode’*
Strong Telic	*P*	*ES*	*49*	*λ̣en ‘die’, ṭən ‘dig’, jetən ‘give’, qebegən ‘swell’*

The examples of predicates of all attested actional classes in both diagnostic forms follow, cf. (7)–(16).

Stative ⟨S, S⟩:

(7) a. *ras$_w$əl* *ə-ŝhe* *me-wəzə.*
Rasul 3SG.POSS-head PRS-ache[14]
‘Rasul has a headache.’

14. Possessed nouns, proper names and personal pronouns do not (usually) inflect for case.

b. *ras$_{w}$əl ə-ŝhe wəzə-ʁe.*
Rasul 3SG.POSS-head ache-PST
'Rasul had a headache (for some time).'

Strong Inceptive-Stative ⟨S, ES⟩:

(8) a. *čʼale-m pŝaŝe-r ŝ$_{w}$ə j-e-λeʁ$_{w}$ə.*
boy-OBL girl-ABS good 3SG.A-PRS-see
'The boy loves the girl.'

b. *čʼale-m pŝaŝe-r ŝ$_{w}$ə ə-λeʁ$_{w}$ə-ʁ.*
boy-OBL girl-ABS good 3SG.A-PRS-see-PST
'The boy fell in love with the girl || *loved the girl (for some time).'

Weak Inceptive-Stative ⟨S, {S, ES}⟩:

(9) a. *čʼale-r me-čəje.*
boy-ABS PRS-sleep
'The boy is sleeping.'

b. *čʼale-r čəja-ʁe.*
boy-ABS sleep-PST
'The boy slept (for some time) || fell asleep.'

Processual ⟨P, P⟩:

(10) a. *čʼale-xe-r me-ǯʼeg$_{w}$ə-x.*
boy-PL-ABS PRS-play
'The children are playing.'

b. *čʼale-xe-r ǯʼeg$_{w}$ə-ʁe-x.*
boy-PL-ABS play-PST-PL
'The children played (for some time).'

Strong Ingressive-Processual ⟨P, EP⟩:

(11) a. *čʼale-r wəne-m ma-če.*
boy-ABS house-OBL PRS-run
'The boy is running to the house.'

b. *čʼale-r wəne-m ča-ʁe.*
boy-ABS house-OBL run-PST
'The boy started running to the house || *came to the house running || *ran to the house for some time.'

Strong Multiplicative ⟨M, Q⟩:

(12) a. *čʼale-r me-wəẑ$_{w}$əntxe.*
boy-ABS PRS-spit
'The boy is spitting.'

b. *čʼale-r wəẑ$_{w}$əntxa-ʁ.*
boy-ABS spit-PST
'The boy spat (once || *for some time).'

Weak Multiplicative ⟨M, {M, Q}⟩:

(13) a. *čʼale-r* *ma-pske*.
boy-ABS PRS-cough
'The boy is coughing.'

b. *čʼale-r* *pska-ʁe*.
boy-ABS cough-PST
'The boy coughed (once || for some time).'

Punctual ⟨– , ES⟩ :

(14) a. *pŝaŝe-m* *ʔ$_w$ənčʼəbze-r* *q-e-ʁ$_w$etə*.
girl-OBL keys-ABS DIR-PRS-find
'The girl (always) finds the keys || *is finding the keys now.'

b. *pŝaŝe-m* *ʔ$_w$ənčʼəbze-r* *q-ə-ʁ$_w$etə-ʁ*.
girl-OBL keys-ABS DIR-3SG.A-find-PST
'The girl found the keys.'

Strong Telic ⟨P, ES⟩:

(15) a. *thamate-m* *zeʔ$_w$əčʼe-r* *r-j-e-ʁa-žʼe*.
director-OBL meeting-ABS 3SG.IO-3SG.A-PRS-CAUS-begin
'The director is opening the meeting.'

b. *txamate-m* *zeʔ$_w$əčʼe-r* *r-jə-ʁe-žʼa-ʁ*.
director-OBL meeting-ABS 3SG.IO-3SG.A-CAUS-begin-PST
'The director opened the meeting || *tried to open the meeting but failed.'

(16) a. *mələ-r* *me-ṭ̇k$_w$ə*.
ice-ABS PRS-melt
'The ice is melting.'

b. *mələ-r* *ṭ̇k$_w$ə-ʁe*.
ice-ABS melt-PST
'The ice melted (completely || ??partly).'

Two observations based on this data can be made. First of all, the actional system of Adyghe seems to be rather straightforward. Indeed, it includes only cross-linguistic actional classes, and, in comparison to other languages to which Tatevosov's procedure has been applied, it is not very rich: contrary to usual assumptions based on Vendler's quadripartite distinction, it is probably a norm for a language to have a score or so of actional classes, among which usually are found some with rather peculiar and unexpected features (cf. e.g. Arkadiev (to appear) for a discussion of Lithuanian); the Adyghe system with its nine actional classes of which only seven contain more than one verb looks rather poor.

The second, and more important, feature of the actional system of Adyghe is the clear predominance of 'strong' (actionally unambiguous) predicates over 'weak' (actionally ambiguous) ones. Indeed, the only Weak Inceptive-Stative predicate found so far is *čəjen* 'to sleep'; different native speakers, however, are quite consistent in allowing both the durative ('is sleeping', cf. (9a)) and the inceptive ('fell asleep', cf. (9b)) interpretations of this predicate. Rather unexpected is the non-existence in Adyghe of Weak Telic predicates, i.e. those which allow both a telic and an atelic reading of the Preterite; according to Tatevosov (2002), such predicates (which have not been thoroughly studied until recently, cf. Koenig & Muansuwan 2000; Smollett 2005; Bar-el et al. 2006; Tatevosov and Ivanov, this volume) are found in such diverse languages as Mari (Finno-Ugric family), Tatar (Turkic family) and Bagwalal (North-East Caucasian family), as well as in Thai and some Salish languages. In this respect Adyghe is superficially similar to English: neither language allows the 'non-culminating' interpretation of telic predicates (unless combined with cumulative incremental themes) in perfective aspect.[15]

However, the picture presented above shows only half of the story. Things alter, and quite drastically, when temporal adverbials come into play. This will be discussed in the following section.

5. Interaction of predicates with temporal adverbials in Adyghe

Cross-linguistically, two types of temporal adverbials are usually identified as particularly relevant for discussions of aspect (cf. Bertinetto & Delfitto 2000): adverbials of temporal duration (e.g. English *for half an hour*, *for two minutes*) and adverbials of temporal extent (e.g. English *in half an hour*, *in two minutes*). These two types of adverbials are important precisely because they serve to distinguish telic eventualities from atelic ones (see, for instance, Vendler 1967; Dowty 1979). However, as the data from Adyghe will show, the applicability of such an 'adverbial test' for determining (a)telicity is subject to typological variation, too.

In Adyghe, temporal duration is denoted by such adverbials as *səhatnəq$_{w}$e* 'for half an hour', *taqjəqjət̡$_{w}$e* 'for two minutes', which specify the (maximal) duration of the situation denoted by the predicate and thus impose external boundaries on it. Thus, these expressions may be considered quite close equivalents of English *for*-adverbials. Temporal extent is expressed by adverbial expressions with the highly

15. However, according to Smollett 2005, even English sometimes allows the non-culminating reading of accomplishment predicates with quantized incremental themes.

polyfunctional Instrumental case marker *-ɕ'e* suffixed to a form which sometimes is identical to the respective adverbial of duration and sometimes has a different final vowel: *səhatnəq$_w$e-ɕ'e* 'in half an hour', *taqjəqjəṭ$_w$ə-ɕ'e* 'in two minutes'. Like their English counterparts, these expressions denote the duration of a situation with a specified terminal point; however, there are certain subtleties which will be now discussed.

Let us start with adverbials of temporal extent, whose behaviour is more straightforward. The investigation has shown that expressions such as *səhatnəq$_w$e-ɕ'e* 'in half an hour' more or less freely combine with all predicates whose actional characteristic includes an instantaneous actional meaning (ES, EP, and Q). That means that they co-occur not only with genuinely Telic predicates (cf. examples (17a,b)), but also with Strong Inceptive-Stative (18), Weak Inceptive-Stative (19), Strong Ingressive-Processual (20), Strong Multiplicative (21), and Punctual (22) predicates.

Strong Telic

(17) a. *mašine-r taqjəq-jə-tfə-ɕ'e qe-wəc$_w$ə-ʁ.*
car-ABS minute-INF-five-INS DIR-stop-PST
'The car stopped in five minutes (after the driver stepped on the brakes).'

b. *pŝaŝe-m səhat-nəq$_w$e-ɕ'e pjəsme-r ə-txə-ʁ.*
girl-OBL hour-half-INS letter-ABS 3SG.A-write-PST
'The girl wrote the letter in half an hour.' (the whole situation of writing the letter took half an hour, and was completed)

Strong Inceptive-Stative

(18) *ɕ'ale-m pŝaŝe-r taqjəq-jə-ṭ$_w$ə-ɕ'e ə-λeʁ$_w$ə-ʁ.*
boy-OBL girl-ABS minute-INF-two-INS 3SG.A-see-PST
'The boy saw the girl in two minutes.' (two minutes passed before he saw her)

Weak Inceptive-Stative

(19) *ɕ'ale-r səhat-nəq$_w$e-ɕ'e čəja-ʁe.*
boy-ABS hour-half-INS sleep-PST
'The boy fell asleep in half an hour.' (after having gone to bed)

Strong Ingressive-Processual

(20) *ɕ'ale-r taqjəq-jə-š'ə-ɕ'e ča-ʁe.*
boy-ABS minute-INF-three-INS run-PST
'The boy started running in three minutes.' (after his father called him)

Strong Multiplicative

(21) *ɕ'ale-r taqjəq-jə-ṭ$_w$ə-ɕ'e wəẑ$_w$əntxa-ʁ.*
boy-ABS minute-INF-two-INS spit-PST
'The boy spat (again) in two minutes.'

Punctual

(22) *ʔeg$_w$awe-r taqjəq-jə-ṭ$_w$ə-č̣'e qe-wa-ʁ.*
balloon-ABS minute-INF-two-INS DIR-explode-PST
'The balloon exploded in two minutes.'

By contrast, adverbials of temporal extent, as expected, never combine with Stative predicates, cf. (23a,b):

(23) a. **mə ɕəfə-r jəλes-jə-tfə-č̣'e ʔə-ʁe.*
this man-ABS year-INF-five-INS old-PST
Intended meaning: 'This man grew old in five years.'

b. **s-šə jəλes-jə-tfə-č̣'e č̣'elejeʁeǯ'a-ʁ.*
1SG.POSS-brother year-INF-five-INS teacher-PST
Intended meaning: 'My brother became a teacher in five years.'

In order to express inceptive meaning such as the one intended in (23a) and (23b), special formal means are necessary. From some Stative verbs inceptive derivations may be formed with the multifunctional 'directional' prefix *qe-*, cf. (24a); others may form complex predicates with the inchoative verb *χ$_w$ən* 'to become', cf. (24b):

(24) a. *mə ɕəfə-r jəλes-jə-tfə-č̣'e qe-ʔə-ʁ.*
this man-ABS year-INF-five-INS DIR-old-PST
'This man grew old in five years.'

b. *s-šə jəλes-jə-tfə-č̣'e č̣'elejeʁaǯ'e χ$_w$ə-ʁe.*
1SG.POSS-brother year-INF-five-INS teacher become-PST
'My brother became a teacher in five years.'

With the Processual predicates the situation is more complicated. It seems that there is no strict ban on their co-occurrence with adverbials of temporal extent. When elicited in isolation, examples like (25a) are judged strange and sometimes unacceptable by native speakers; however, when a subordinate clause with a temporal meaning is added, they become more felicitous, cf. (25b):

(25) a. ??*č̣'ale-r taqjəq-jə-tfə-č̣'e qe-ŝ$_w$a-ʁ.*
boy-ABS minute-INF-five-INS DIR-dance-PST
Intended meaning: 'The boy started dancing in five minutes.'

b. *se sə-qə-z-je-ha-m pŝaŝe-r səhat-nəq$_w$e-č̣'e*
1 SG.S-DIR-SBD-LOC-enter-OBL girl-ABS hour-half-INS
telewizorə-m je-pλə-ʁ
television-OBL 3SG.IO-watch-PST
'After I came in, the girl in half an hour started watching television.'

I would offer the following explanation of the contrast observed in (25). The semantics of adverbials of temporal extent in Adyghe, as is implied by their broad co-occurrence with various actional classes besides the Strong Telic verbs, may be formulated as 'the transition denoted by the predicate takes place at the end of the interval denoted by the adverbial', and does not presuppose any particular process coextensive with the relevant temporal interval.[16] What is important, however, is that the adverbial requires that the endpoint of the temporal interval it denotes coincided with the transitional event expressed by the verb. Those predicates which have lexically specified transition (sub)events (Telic, Inceptive-Stative, Punctual etc.) satisfy this condition and thus felicitously combine with the adverbials of temporal extent. Processual predicates like *qeŝ$_{w}$en* 'dance' or *jepλen* 'watch', however, do not have any lexically encoded transition, but allow a more or less natural reinterpretation (*coercion*, in terms of de Swart 1998), viz. the ingressive one: in the context of the adverbial of temporal extent they express the entry into the process they denote, just as Ingressive-Processual predicates, which specify the initial point of the process lexically. However, in order to facilitate such a reinterpretation, a contextual temporal 'anchor' is necessary, which would specify the initial point of the interval denoted by the adverbial.[17] When such a contextual temporal point is provided, like in (25b), coercion is easier.

Let us now turn to adverbials of temporal duration, whose behavior in Adyghe is more intricate.

As expected, adverbials of duration freely combine with durative (atelic) predicates, i.e. those belonging to the Stative (26), Weak Inceptive-Stative (27), Processual (28) and Weak Multiplicative (29) classes.

Stative

(26) *λ̣əẑə-r* *jəλes-jə-t$_{w}$e* *λešʲa-ʁ.*
old.man-ABS year-INF-two lame-PST
'The old man was lame for two years.'

16. In this respect they are similar to English *in*-adverbials, which may also measure the time up to the starting point of the situation, as in *John ran in two minutes*. I am grateful to an anonymous reviewer for hinting at this point.

17. Strictly speaking, such a temporal boundary is necessary for all predicates except the Telic ones to co-occur with adverbials of temporal extent. However, when the right boundary of the interval denoted by the adverbial is provided by the lexical semantics of the verb, its left boundary may be left implicit, whereas when both endpoints must be inferred from the context the sentence sounds strange.

Weak Inceptive-Stative

(27) *pŝaŝe-r səhat-jə-ble čəja-ʁe.*
girl-ABS hour-INF-seven sleep-PST
'The girl slept for seven hours.'

Processual

(28) *çəfə-r səhat-nəq$_w$e g$_w$əš'ə^{ʔ}a-ʁe.*
man-ABS hour-half talk-PST
'The man talked for half an hour.'

Weak Multiplicative

(29) *səmaǯ'e-r taqjəq-jə-ṭ$_w$e pska-ʁe.*
ill-ABS minute-INF-two cough-PST
'The patient coughed for two minutes.'

This, however, is just a half of the story. The co-occurrence possibilities of Adyghe durational adverbials are not restricted to the above-mentioned classes; they freely combine also with those predicates whose Preterite in isolation does not admit a durative interpretation, i.e. with Strong Inceptive-Stative (30), Strong Ingressive-Processual (31), Strong Multiplicative (32), and Strong Telic (33a), (33b) predicates.

Strong Inceptive-Stative, cf. (8)

(30) *č'ale-m pŝaŝe-r jəλes-jə-tfe ŝ$_w$ə ə-λeʁ$_w$ə-ʁ.*
boy-OBL girl-ABS year-INF-five good 3SG.A-see-PST
'The boy was in love with the girl for five years.'

Strong Ingressive-Processual, cf. (11)

(31) *samoljwetə-r səhat-jə-ṭ$_w$ə krasnwedar bəbə-ʁe.*
airplane-ABS hour-INF-two Krasnodar fly-PST
'The airplane flew in the direction of Krasnodar for two hours.'

Strong Multiplicative, cf. (12)

(32) *çəfə-m čəgə-r taqjəq-jə-šʲe ə-ʁe-səsə-ʁ.*
man-OBL tree-ABS minute-INF-three 3SG.A-CAUS-shake-PST
'The man shook the tree for three minutes.'

Strong Telic, cf. (15), (16)

(33) a. *č'ale-m səhat-nəq$_w$e pjəsme-r ə-txə-ʁ.*
boy-OBL hour-half letter-ABS 3SG.A-write-PST
'The boy wrote the letter for half an hour.'

b. *mələ-r mef-jə-tfe ṭ̇k$_w$ə-ʁe.*
ice-ABS day-INF-five melt-PST
'The ice melted for five days.'

The only actional class whose members normally do not combine with durational adverbials is the Punctual class (34a); however, in contexts with quantified arguments recategorization is possible, cf. example (34b):

(34) a. *ʔeg$_w$awe-r taqjəq-jə-ṭ$_w$e qe-we-ʁ.
balloon-ABS minute-INF-two DIR-explode-PST
'*The balloon exploded for two minutes.'

b. ʔeg$_w$awe-xe-r taqjəq-jə-ṭ$_w$e qe-we-ʁe-x.
balloon-PL-ABS minute-INF-two DIR-explode-PST-PL
'The balloons exploded (one after another) for two minutes.'

From the data in (26) – (34) it is possible to infer the following generalization: in Adyghe, the predicates which allow combination with adverbials of temporal duration are those which have in their actional characteristic a non-empty Ipf set. Indeed, only Punctual predicates unambiguously prohibit both the co-occurrence with durational adverbials and the progressive interpretation of the Present tense, cf. (14a). Moreover, in the presence of a plural argument, which enables the predicate to denote a durative (more precisely, iterative) eventuality, Punctual predicates not only combine with adverbials of duration, cf. (34b), but, naturally, allow progressive Present, too, cf. (35).

(35) ʔeg$_w$awe-xe-r q-e-we-x.
balloon-PL-ABS DIR-PRS-explode-PL
'The balloons are exploding (one after another).'

Things are, nonetheless, still more complicated. At least some native speakers do not allow all of the Strong Telic verbs to combine with durational adverbials. Some of these predicates, such as *txən* 'write' (33a) or *ṭḳ$_w$ən* 'melt' (33b), do co-occur with them, but others, such as, for instance, *jeʁežén* 'begin', do not, cf. (36a). That this predicate is not Punctual, but genuinely Strong Telic, is seen from the fact that it allows a natural Progressive interpretation, cf. (15a), repeated here as (36b).

(36) a. *txamate-m taqjəq-jə-šé ze^ʔ_wəč́e-r
director-OBL minute-INF-three meeting-ABS
r-jə-ʁe-žéa-ʁ.
3SG.IO-3SG.A-CAUS-begin-PST
'*The director opened the meeting for three minutes (e.g. he tried to open the meeting for three minutes, but failed, e.g. because the people were too loud).'

b. thamate-m ze^ʔ_wəč́e-r r-j-e-ʁa-žé.
director-OBL meeting-ABS 3SG.IO-3SG.A-PRS-CAUS-begin
'The director is opening the meeting.'

The question of what precisely determines the ability of certain Strong Telic verbs in Adyghe to combine with adverbials of duration is not yet firmly resolved. However, at least for those native speakers who show a contrast between such verbs as *txən* 'write', on the one hand, and *jeʁežʼen* 'begin', on the other, it is mostly probable that we are dealing with the contrast between what Ivanov and Tatevosov (this volume) call *mapping to a minimal final part* and *incremental relation*. Incremental Strong Telic verbs, which presuppose a one-to-one mapping between the parts of the process subevent and the resulting state (see Krifka 1989, 1992, 1998; Filip 1999; Rothstein 2004), allow a more or less natural non-culminating interpretation in the presence of durational adverbials, viz. the following: 'the process denoted by the verb lasted for the time-span denoted by the adverbial, and was terminated without attaining its natural endpoint'. Thus (33a) means that the boy was engaged in writing a letter for half an hour and ceased it without having written it completely, but nevertheless have written a part of it.

By contrast, non-incremental predicates like *begin* do not allow such a reading. In those languages where such predicates combine with durational adverbials (e.g. in Bagwalal, Mari and Tatar, see Ivanov and Tatevosov, this volume) they allow only a 'failed attempt' interpretation, like the one intended in (36a); this is because there is no mapping between parts of the processual subevent of eventualities denoted by such predicates and the final state: while it is normally true that the longer one writes a letter the more of the letter is written, it is not true that the longer one is engaged in opening a meeting the closer is the meeting to its start, and, consequently, if one has ceased writing a letter halfway then the letter is half-written, but if one has ceased opening the meeting before one has indeed opened it, one has not opened it at all. What is important about Adyghe is that, similarly to English, it usually does not allow the 'failed attempt' interpretation of Strong Telic predicates.[18]

These issues put aside, it is necessary to somehow account for the data presented in this section, especially for the behavior of the adverbials of temporal duration. To recapitulate, we saw that these adverbials may perfectly co-occur with the Preterite form of predicates whose Preterite in isolation does not allow a durative interpretation. How is this situation to be explained? I envisage two possible accounts.

The first one, which I call 'lexical', is in the vein of proposals made by Tatevosov (2002, 2005) in order to explain facts from Bagwalal, Mari and Tatar, which are only in some respects similar to those of Adyghe. The lexical account considers the

18. I say 'usually' since there are native speakers who allow 'failed attempt' readings; however, among my consultants they constitute a minority.

adverbial data as diagnostic for the actional characteristic of the predicate. If the predicate allows a processual interpretation of the Preterite, regardless of whether it is observed in isolation or in the context of adverbials, it is assigned to one of the Weak classes. Under these assumptions, most of Adyghe Strong predicates are in fact Weak, i.e. inherently actionally ambiguous: their Preterite forms always allow both instantaneous (ES, EP, Q) and durative (S, P, M) interpretations, but the latter require special context which is provided precisely by the durational adverbials. Moreover, for many native speakers the counterparts of Vendler's accomplishments are split into two classes: the Weak Telic class which comprises incremental verbs which co-occur with durational adverbials, and the Strong telic class encompassing the non-incremental predicates which do not thus co-occur.

The other account, which I will call 'compositional' (cf. Depraetere 1995; Smith 1995; de Swart 1998), draws a strict division between the interpretations available to the predicate in isolation and those it admits when combined with different kinds of modifiers, and assumes that in the latter case it is the modifiers, and not just the inherent lexical properties of the predicate, which determine possible shifts in interpretation. Under the compositional account, Adyghe actional classes remain as shown in Table 2, but actional characteristics of predicates are subject to change when they are combined with certain types of modifiers. These changes in aspectual interpretation are, under such an account, fairly general and predictable from principles of semantic compositionality.

In the next section I will present some empirical arguments in favour of the compositional account of the data discussed so far.

6. Arguments for the compositional account

There are several kinds of evidence which can help choose between the two possible accounts of the behavior of Adyghe temporal adverbials which were outlined in the end of the last section. The first piece of evidence comes from cross-linguistic comparison. If we assume the lexical account, which forces us to treat almost all Adyghe predicates as Weak, we will have to explain why the alleged Weak predicates in Adyghe behave differently from corresponding Weak predicates in other languages. Let us discuss this point in greater detail.

As Tatevosov (2002) shows, Weak Inceptive-Stative and Weak Ingressive-Processual predicates in Bagwalal show their aspectually ambiguous behavior regardless of whether a durational adverbial is present. Thus, such sentences as (37) and (38) (taken from Tatevosov 2002: 383, 385) when uttered in isolation may receive both a punctual (ES, resp. EP) and a durative (S, resp. P) interpretation.

(37) *moHammad-i-la o-b zadača b-uhã.*
Mohammed-OBL-DAT this-N task N-understand
'Mohammed came to understand this task || understood this task for some time.'

(38) *pat'imat qari.*
Fatima cry
'Fatima started crying || cried for some time.'

In Adyghe, there is at least one predicate that behaves precisely in this way, i.e. *čəjen* 'sleep', see example (9b); just like the Bagwalal Weak Inceptive-Stative verb *-uhã* 'understand', uttered in isolation it allows two readings: one that denotes transition and one that denotes a durative state. However, other Inceptive-Stative and Ingressive-Processual ('initiotransformative', to use a useful cover term proposed by Johanson 1996, 2000) predicates found in Adyghe rather follow the model of the Bagwalal *hã̃* 'see', compare (39) (Tatevosov 2002:382) and (8b), or Tatar *kajna* 'boil', compare (40) (Tatevosov 2002:395) and (11b), which are both unambiguously Strong Inceptive-Stative (resp. Strong Ingressive-Processual).

(39) *moHammad-i-ba ʕali hã̃.*
Mohammed-OBL-AFF Ali see
'Mohammed saw (= caught sight of) Ali || *saw Ali for some time.'

(40) *su kajna-dɤ.*
water boil-PST
'Water came to boil, started boiling || *boiled for some time.'

The distinction between Strong and Weak predicates in Bagwalal and Tatar is quite well established and is evident regardless of whether durational adverbials are present; moreover, as far as I can judge from Tatevosov (2001: 251–263), Strong verbs in Bagwalal, in contrast to their Adyghe counterparts, do *not* combine with durational adverbials. However, the fact that Adyghe and Bagwalal Strong predicates behave alike in isolation but differ in combination with adverbials of temporal duration hints at a conclusion that the contrast between the two languages lies not in the properties of their verbal lexicon, but rather in those features of their syntax (or, perhaps, their syntax-semantics interface) which determine the compatibility of verbs of different classes with adverbials and the semantic outcome of such combinations.

The second type of evidence comes from Adyghe itself. It turns out that there are certain morphological forms of predicates which are sensitive precisely to the actional characteristics as shown in Table 2, but do not reflect the range of meanings which become available to predicates in combination with temporal adverbials. One such form will be discussed here in detail.[19]

19. The material presented in this subsection was collected by Dmitry Gerasimov in Haqwerinehabl in 2006. The idea that there is a principled link between the interpretation of

In Adyghe there is a whole range of different non-finite verbal forms which may be used as heads of sentential complements, sentential adjuncts, or both (see Gerasimov 2006 for an overview). The form I am going to discuss consists of a subordinating prefix *zere-* and of an adverbializing suffix *-ew*. It has two basic interpretations: the one illustrated in (41) may be called 'punctual' and denotes an event which occurred immediately before the one expressed by the main clause. The other interpretation, the 'durative' one, shown in (42), denotes a situation which serves as a sort of background against which the event of the main clause occurs; such uses of this construction often assume concessive meaning.

(41) *ə-ŝhe* *qə-zer-jə-ʔat-ew* *sə-wa-ʁ.*
3SG.POSS-head DIR-SBD-3SG.A-raise-ADV 1SG.A-shoot-PST
'As soon as he raised his head, I shot.'

(42) *č'ale-r* *zera-psk-ew* *jeǯ'aṗe-m* *k̩$_w$a-ʁe.*
boy-ABS SBD-cough-ADV school-OBL go-PST
'The boy, (although) still coughing, went to school.'

The choice between the two interpretations of the forms in *zere-…-ew* crucially depends on the actional class of the predicate. Stative (43), Processual (44), and Weak Multiplicative (42)[20] predicates allow only the durative reading, whereas Strong Inceptive-Stative (45) and Punctual (41) predicates show only the punctual reading.

(43) *č'ale-r* *zere-səmaǯ'-ew,* *jeǯ'aṗe-m* *k̩$_w$a-ʁe.*
boy-ABS SBD-ill-ADV school-OBL go-PST
'The boy, still being ill, went to school. || *The boy went to school as soon he became ill.'

(44) *karwəselə-r* *ǯ'ərjə* *zere-čereʁ$_w$-ew* *sabəjə-r* *q-jə-č'əž'ə-new*
caroussel-ABS still SBD-turn-ADV child-ABS DIR-3SG.A-get.off-SBD
feja-ʁ.
want-PST
'The child wanted to get off the carrousel while it was still turning || *when it started (stopped) turning.'

(45) *šak̩$_w$e-m* *pŝaŝe-r* *zer-jə-λeʁ$_w$-ew* *ŝ̩$_w$ə* *ə-λeʁ$_w$ə-ʁ.*
hunter-OBL girl-ABS SBD-3SG.A-see-ADV good 3SG.A-see-PST
'The hunter fell in love with the girl as soon as he saw her || *still seeing her'

---

the *zere-…-ew* forms and the actional classes belongs to him (see also Gerasimov & Arkadiev 2007). I am grateful to Dmitry for allowing me to use these data in my paper and for a useful discussion of it. All responsibility for possible misinterpretations is mine.

20. In this example the predicate is clearly interpreted non-episodically; it is not entirely obvious how Strong Multiplicative verbs behave in such contexts. I have no examples of the Quantum reading of *psken* 'cough' in this construction.

The most telling are the Weak Inceptive-Stative verb *čəjen* 'sleep' and the Strong Telic verbs. While Stative predicates allow only the durative interpretation in this construction (43), and the Strong Inceptive-Stative predicates allow only the punctual one (45), the Weak Inceptive-Stative predicate allows both, as (46a) and (46b) clearly show:

(46) a. *ҫ̌'ale-r zere-čəj-ew, pҫ̌'əhape ə-ɬeʁ$_{w}$ə-ʁ.*
boy-ABS SBD-sleep-ADV dream 3SG.A-see-PST
'As soon as the boy fell asleep, he saw a dream.'

b. *ҫ̌'ele-ҫəḳ$_{w}$ə-r zere-čəj-ew, wəne-m r-a-xə-ʁ.*
boy-little-ABS SBD-sleep-ADV house-OBL LOC-3SG.A-carry-PST
'While the little boy was still sleeping, they carried him out of the house.'

Thus, it is clear that the *zere-...-ew* form is sensitive to the actional characteristics predicates have in isolation: the contrast between the Strong and Weak Inceptive-Stative predicates, which is neutralized in the scope of durational adverbials, is unequivocally preserved in the non-finite form discussed here.

Similarly, the division of the Adyghe Strong Telic verbs into two types according to their ability to combine with adverbials of temporal duration is completely irrelevant to the *zere-...-ew* form: both types of Strong Telic verbs admit only the punctual interpretation in this construction, cf. (47), (48) (*ɬ̣en* 'die' does not allow adverbials of duration) and (49).

(47) a. *ҫ̌'ale-m čʼewə-r səhat-nəq$_{w}$e ə-ʁela-ʁ.*
boy-OBL fence-ABS hour-half 3SG.A-paint-PST
'The boy has been painting the fence for half an hour.'

b. *ҫ̌'ale-m čʼewə-r zer-jə-ʁal-ew, weŝ$_{w}$ə q-je-xə-ʁ.*
boy-OBL fence-ABS SBD-3SG.A-paint-ADV hail DIR-LOC-come.down-PST
'Just as the boy finished painting the fence, it started to hail. || *While the boy was still painting the fence, it started to hail.'

(48) *Asɬan zera-ɬ̣-ew jə-ҫ̌'ale-xe-r zefeg$_{w}$əbžə-ʁe-x.*
Aslan SBD-die-ADV 3SG.POSS-child-PL-ABS quarrel.with.each.other-PST-PL
'As soon as Aslan died (|| *while Aslan was still dying), his children started quarrelling.'

(49) *ҫ̌'ale-r txəɬə-m zer-je-ǯ'-ew ǯ'eg$_{w}$ə-new jəҫ̌'ə-ʁ.*
boy-ABS book-OBL SBD-3SG.IO-read-ADV repast-SBD go-PST
'As soon as the boy has read the book (|| *still reading the book), he went for a walk.'

From the data presented above it is clear that the non-finite *zere-…-ew* forms preserve the independently established distinction between the Strong and Weak Inceptive-Stative predicates, but fail to reveal any contrast between those Telic

predicates which co-occur with durational adverbials and those which do not. Both these facts allow the following generalization: the interpretation of the *zere-…-ew* forms depends only on those actional meanings which the predicate (more precisely, its Preterite form) has in isolation. This is an important piece of evidence for the conclusion that it is these and only these actional meanings that belong to the lexical specification of the predicate, while the interpretations which arise in the context of temporal adverbials of duration belong to the level of 'derived situation types' (in terms of Smith 1997/1991).

Thus, we now see that the material of Adyghe is better accounted for under the assumptions of a multi-layered compositional conception of aspect, which treats temporal adverbials as a separate level of aspectually relevant operators, with its own combinatorial properties and constraints and, importantly, with an ability to affect the lexically specified actional properties of the predicate in a semantically-driven way.

7. Conclusions and implications

In the previous sections of this paper we have seen that a fragment of the aspectual system of Adyghe (in fact, the central fragment) can be described in terms of a small set of relatively simple and intuitively plausible notions. The latter include the two universal aspectual viewpoints (perfective and imperfective) and two sets of primitive actional meanings: the durative state, process, and multiplicative process, and the instantaneous entry-into-a-state, entry-into-a-process, and quantum-of-a-multiplicative-process. A tentatively universally applicable empirical procedure which crucially hinges on these notions and their interaction allows us to characterize a system of actional classes of predicates, which has a high degree of linguistic relevance, in the sense that to a large extent it determines different types of aspectual behaviour of predicates, and does so in a systematic and predictable way. That this conception of actionality can be adequately applied to material of different and typologically diverse languages has been already shown by previous research (see Tatevosov 2002); this paper, I hope, has presented another piece of evidence in favour of Tatevosov's theory of actionality.

Another important point made in this paper concerns the interaction of predicates with different actional properties with temporal adverbials, in particular with the adverbials of temporal duration. The data discussed in Section 5 presents certain problems for a conception of aspectual compositionality which lays the whole burden of responsibility for the aspectual interpretation of sentences on the lexical meaning of the predicate (setting aside phenomena known as aspectual composition of the predicate with its arguments). As the data from Adyghe

clearly show, in this language temporal adverbials constitute a separate layer of aspectually relevant operators and are able to shift the lexically specified actional properties of predicates in a predictable way. The particular mechanisms of such aspectual type-shifting and the possible ways they may be formally implemented in a given model of aspectual structure is, to my mind, of less importance than the fact that any such model which aims at descriptive (let alone explanatory) adequacy and cross-linguistic validity should be able to account for this kind of interaction between the semantic features of verbs and of adverbials (for particular proposals on that issue see the already mentioned Smith 1995, 1997/1991; de Swart 1998, 2000; and Güven 2006).

Thus, Adyghe material provides important evidence for the idea that aspectual structure has a richer architecture than is usually assumed even by the proponents of 'bidimensional' theories of aspect (cf. Sasse 2002): between the 'inner' level of lexically-driven actional properties of predicates and the 'outer' level of viewpoints there is at least one separate level of aspectual operators, viz. the temporal adverbials. The degree of prominence and importance this level acquires is subject to cross-linguistic variation; Adyghe is an example of a language where this level is, as it seems, very prominent.

The last point I would like to make pertains to the methodology of aspectual research, especially with 'exotic' languages as objects of study. One should be extremely cautious using temporal adverbials for various aspectual tests, e.g. as a routine test for determining whether a given predicate is telic or atelic: it is justified only when there is independent evidence that adverbials do not shift the lexically encoded actional meanings of predicates as they do in Adyghe.

Abbreviations

A – agent, ABS – absolutive, ADV – adverbializer, AFF – affective, CAUS – causative, DAT – dative, DIR – directional preverb, INF – interfix, INS – instrumental, IO – indirect object, IPF – imperfect, LOC – locative preverb, N – neuter, OBL – oblique, PL – plural, POSS – possessive, PRS – present, PST – preterite, S – intransitive subject, SBD – subordinator, SG – singular, SOC – sociative

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Event structure of non-culminating accomplishments*

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In this paper, we examine *failed attempt and partial success interpretations* of *accomplishment verbs* cross-linguistically. We observe that accomplishments differ systematically as to which of these readings they can produce. Relying on Rothstein's (2004) theory of accomplishments, we propose that this diversity can be accounted for through *properties of the relation between subevents* in the accomplishment event structure.

1. Failed attempts

Accomplishment verbs in a variety of genetically and areally unrelated languages display what we call from now on *a failed attempt interpretation*. A few illustrations from Karachay-Balkar (Altaic, Turkic), Mari (Uralic, Finno-Ugric), Bagwalal (North Caucasian, Nakh-Daghestanian, Andic), and Russian are given in (1)–(4).

(1) Karachay-Balkar (Altaic, Turkic)

a. *fatima eki sekunt-xa xalɨ̇-nɨ̇ zɨ̇rt-tɨ̇.*
F. two second-DAT thread-ACC tear-PST.3SG[1]
'Fatima tore a thread in two seconds.'

*We are grateful to the audience at the Sinn und Bedeutung 10 conference (Berlin, October 2005) and TAMTAM Workshop (Nijmegen, November 2006) for their valuable feedback. The paper has benefited much from detailed comments from the anonymous reviewers of this volume. Most of all, we are extraordinarily indebted to Susan Rothstein for her benevolent attention to our work, insightful suggestions and words of encouragement. Data for this study have been collected during a number of field trips organized by the Department of Theoretical and Applied Linguistics, Moscow State University, in 2000–2006. We would like to express our deeply felt gratitude to the native speakers of Bagwalal, Mari, and Karachay-Balkar for their invaluable help and patience. The study has been supported by Russian Foundation for Basic Research (grant #08-06-00411à) and by Russian foundation for the Humanities (grant #07-04-00337à).

1. The following abbreviations are used throughout this paper: **1** 1st person, **3** 3rd person, ACC accusative, CAUS causative, DAT dative, DELIM delimitative, DET determiner,

b. *fatima eki minut xalʲ-nʲ zʲrt-tʲ.*
F. two minute thread-ACC tear-PST.3SG
'Fatima tried to tear a thread for two minutes.'

(2) Mari (Uralic, Finno-Ugric)

a. *maša jivan-em lu minut-əšte kəčkər-ən.*
M. I.-ACC ten minute-INESS wake.up-PST
'Masha woke up Ivan in ten minutes.'

b. *maša jivan-em lu minut kəčkər-ən.*
M. I.-ACC ten minute wake.up-PST
'Masha tried to wake up Ivan for ten minutes.'

(3) Bagwalal (North Caucasian, Nakh-Daghestanian, Andic)

a. *ʕali-r maħammadi-šːu-b ǯanaza hacʼada minuti-łi*
A.-ERG M.-OBL-GEN.N corpse ten minute-INTER
ihʷar-łi b-ukeː.
lake-INTER N-drown.PST
'Ali drowned Mohammed's corpse in the lake in ten minutes.'

b. *ʕali-r maħammadi-šːu-b ǯanaza čʼera saʕati-r ihʷar-łi*
A.-ERG M.-OBL-GEN.N corpse two hour-ERG lake-INTER
b=ukeː.
N-drown.PST
'Ali tried to drown Mohammed's corpse in the lake for two hours.'

(4) Russian

a. *Vasja otkry-l dver' za minut-u.*
V. open.PFV-PST.M door.ACC in minute-ACC
'Vasja opened the door in a minute.'

b. *Vasja po-otkr-yva-l dver' pjatʼ minut i*
V. DELIM-open-IPFV-PST.M door.ACC five minute.GEN.PL and
brosi-l.
give.up-PST.M
{Context: The lock on the door is broken.} 'Vasja tried to open the door for five minutes and gave up.'

ERG ergative, GEN genitive, INESS inessive, INF infinitive, INTER interessive, IPFV imperfective, M masculine, N neuter, NEG negation, OBL oblique, PFCT perfect, PFV perfective, PL plural, PST past, SG singular, SUBJ subject, TEMP temporal clause, TRANS transitivizer.

In (1)–(4), (a) examples refer to events that culminate so that their internal arguments attain a new state, a state of being torn in (1a), a state of being awake in (2a), a state of being drowned in (3a), and a state of being open in (4a). As the test on co-occurrence with time-span adverbials like 'in two minutes' indicates, these sentences, like their translations into English, are telic.[2] (b) examples are different. Each of them describes an activity performed by the agent that aims at changing a state of the theme. However, this activity terminates before the change is attained, so the agent's attempt to tear a thread, wake up a person, etc., fail, and the theme remains in its initial state. All these sentences accept measure adverbials and are therefore atelic.

A striking fact about the failed attempt interpretation is that it is heavily lexically restricted. Accomplishments differ as to whether they allow for this interpretation, as illustrated in (5)–(8). These examples are parallel to (1)–(4) in that they involve the same verb forms, the same type of arguments (agent and theme), the same reference properties of arguments (all DPs are based on quantized nominal predicates in terms of Krifka 1989, 1992, 1998). Finally, like (1)–(4) they readily have both telic and atelic readings (cf. (a) and (b) examples). On the atelic interpretation, however, (b) sentences do not describe a failed attempt.

(5) Karachay-Balkar (Altaic, Turkic)

a. *alim eki saʁat-xa baxca-nɨ̇ sür-dü.*
A. two hour-DAT field -ACC plow-PST.3SG
'Alim plowed a field in two hours.'

b. *alim eki saʁat baxca-nɨ̇ sür-dü.*
A. two hour field-ACC plow-PST.3SG
1. 'Alim was involved in plowing the field for two hours.'
2. *'Alim tried to plow the field for two hours, (but have not made a single furrow).'

(6) Mari (Uralic, Finno-Ugric)

a. *jivan tide šereš-əm lu minut-əšte voz-en.*
Ivan this letter-ACC ten minute-INESS write-PST
'Ivan wrote this letter in ten minutes.'

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2. In what follows, we assume a conceptual distinction between eventuality type (a.k.a. situation type, Aktionsart, lexical aspect, actionality, etc.) and aspect proper (a.k.a. grammatical aspect, viewpoint aspect, etc.). Following a lot of proposals in the literature, we assume that the former has to do with various properties of event predicates (e.g., telicity), whereas the latter determines how the running time of the event is related to the reference time. Our analysis is thus an instance of what Smith (1991/1997) calls a two-component theory if aspect. See Section 4.4 for further details.

b. *jivan tide šereš-əm lu minut voz-en.*
Ivan this letter-ACC ten minute write-PST
1. 'Ivan was involved in writing this letter for ten minutes.'
2. *'Ivan tried to write this letter for ten minutes, (but have not written a single word).'

(7) Bagwalal (North Caucasian, Nakh-Daghestanian)

a. *paťimati-r gur čera zebu-łi q'ini.*
P.-ERG dress two day-INTER sew.PST
'Fatima sewed a dress in two days.'

b. *paťimati-r gur čera zebu-r q'ini.*
P.-ERG dress two day-ERG sew.PST
1. 'Fatima was involved in sewing a dress for two days.'
2. *'Fatima tried to sew a dress for two days (but have not even started making a pattern).'

(8) Russian (Mehlig 2006)

a. *Vasja zapolni-l anket-u za pjat' minut.*
V. fill.PFV-PST.M form-ACC in five minutes
'Vasja filled in the form in five minutes.'

b. *Vasja po-zapoln-ja-l anket-u pjat' minut.*
V. DELIM-fill-IPFV-PST.M form-ACC five minutes
1. 'Vasja spent five minutes filling in the form.'
2. *'Vasja tried to fill in the form for five minutes (but has not filled in a single entry).'

In (5)–(8), (a) examples have the same interpretation as their (a) counterparts in (1)–(4): the event culminates, and immediately after the culmination the field is (in a state of being) completely plowed, (5a), the letter is written, (6a), the dress is sewed, (7a), and the form is filled, (8a). In atelic (b) examples, the event does not culminate, but in a strikingly different way than in (b) examples in (1)–(4). The failed attempt interpretation in not available for (5b)–(8b): each entails that an affected participant undergoes at least some change. We call this interpretation *a partial success interpretation* hereafter.

Finally, it is not difficult to find verbal predicates that allow for both types of interpretation. For the sake of space, we limit ourselves to illustrating this by one example from Karachay-Balkar:

(9) *išci eki kün/saʁat üj-nü oj-dü.*
worker two day/hour house-ACC destroy-PST.3SG
1. 'The worker tried to take down the house for two days'. {But soon it became clear that it is not possible for a single person; so he gave up, not being able to remove a single brick}.
2. The worker was involved in taking down the house for two hours. {He had already removed two walls, but was asked to stop}.

Unlike verbs in (1)–(8), which can refer either to failed attempts or to partially successful actions, the verb *oj* 'destroy, take down, crumble' is compatible with both scenarios, with the context determining the choice in every specific case. Imagine a big medieval house made of huge heavy rocks and a worker only equipped with a pickax. Here we are most likely to get the interpretation in (9.1). If, on the other hand, the house is a small shack and the worker came with a pneumatic chipper, the interpretation in (9.2) would be most probable.

In what follows, we call verbs like those in (1)–(4) *failed attempt accomplishments* (FA-accomplishments, for short). Verbs in (5)–(8) are referred to as *partial success accomplishments*, or PS-accomplishments. Finally, verbs similar to *oj* 'destroy' in (9) are *non-restricted accomplishments*.

The above observations motivate main questions addressed in the present study. First, we want to know how the failed attempt interpretation in (b) examples in (1)–(4) is compositionally derived and how this interpretation is related to the 'regular' telic interpretation in (a) examples. Secondly, our goal is to determine where the difference between FA-accomplishments like 'tear a thread', 'wake up a person', etc., in (1)–(4) and PS- accomplishments like 'plow a field' 'sew a dress', etc., in (7)–(8) comes from. Thirdly, we have to account for why non-restricted accomplishments like 'destroy' in (9) have both interpretations.

In answering these questions, we take the following steps. First, we identify the FA-predicates, PS-predicates and non-restricted predicates as special cases of non-culminating accomplishments. After reviewing a number of proposals accounting for the non-culmination in Section 2, we conclude that the difference between the failed attempt and partial success interpretations has to do with the lexical meaning of corresponding accomplishments verbs. In Section 3, we will see that most theories of accomplishment event structure face difficulties in capturing this difference. In Section 4 we propose that FA-verbs are distinguished from PS-verbs in terms of the relation between activity and become subevents in their semantic representation. Non-restricted accomplishments are characterized as underspecified with respect to such a relation. A number of more general issues related to the data and analysis discussed in the present paper are addressed in Section 5.

2. Non-culminating accomplishments

2.1 Non-culminating accomplishments

A part of the answer to the question about how the failed attempt interpretation is compositionally derived suggests itself immediately. All verbal predicates in (b) examples above, including those that refer to failed attempts, are evidently

instances of *non-culminating accomplishments* extensively discussed in the literature (see Ikegami 1985; Koenig & Muansuwan 2001; Tatevosov 2002; Bar-el et al. 2005; Bar-el 2006). So a reasonable null hypothesis would be that whatever mechanism creates non-culminating accomplishments, it is likely to be involved in the derivation of failed attempts. Let us therefore discuss non-culminating accomplishments in some detail.

(10)–(11) illustrate non-culminating accomplishments in Thai and Sťáťimcets in (b) examples contrasted with corresponding culminating ones in (a) examples:

(10) Thai (Koenig & Muansuwan 2001).

a. *Surii tɛ̀ɛŋ klɔɔn kʰûm.*
s. compose poem ascend
'Surii composed a/the poem.'

b. *Surii tɛ̀ɛŋ klɔɔn kʰûm tɛ̀ɛ jaŋ mâj sèd.*
s. compose poem ascend but still not finish
Lit. 'Surii composed a/the poem, but she has not finished it yet.'

(11) Sťáťimcets (Bar-el et al. 2005)

a. *máys-en-lhkan ti q'láxan-a.*
fix-TRANS-1SG.SUBJ DET fence-DET
'I fixed the fence.'

b. *máys-en-lhkan ti q'láxan-a, t'u7 cw7aoy t'u7 kw-s*
fix-TRANS-1SG.SUBJ DET fence-DET but NEG just DET-NOM
tsúkw-s-an.
finish-CAUS-1ERG
Lit. 'I fixed the fence, but I didn't finish.'

In the literature, one can find a few proposals as to how non-culminating readings like those in (10)–(11) are generated. The vast majority of them can be thought of as instances of what we call *a partitive theory of non-culmination*. After reviewing this type of theory in subsequent sections, we will see that for a number of reasons it only offers one of a few necessary ingredients of the analysis. Other ingredients will be developed in Sections 3–4.

2.2 Partitive theory

The basic intuition behind various versions of the partitive theory is that events referred to by non-culminating accomplishments are nothing but parts of events from the denotation of culminating ones. Take 'fix a fence' from (11) as an example. The complete event of fixing a fence involves agent's activity, a corresponding change of state of the theme and the resultant state of the fence being fixed. (11b),

however, describes a "smaller" eventuality, whereby the fence does not undergo sufficient change to count as a fixed one. Up to some point, complete and incomplete eventualities develop in exactly the same way, and the difference between them has to do with the fact that the latter stop before the culmination, whereas the former reach it. This suggests a very simple architecture of the analysis. We start with a predicate that only have complete eventualities in its extension, and by applying an operator that maps these eventualities into incomplete ones, the desired non-culminating reading is derived.

Specific implementations of this idea can vary. Manfred Krifka (1998: 215) in his brief comment on the semantics of measure adverbials like *for an hour* suggests that in order to accept such adverbials a quantized event predicate can be coerced into an imperfective interpretation. Krifka defines the imperfective version of a quantized predicate *P* as a predicate that applies to events *e′* iff there is an event *e* such that *P(e)*, and *e′* < *e*. That is:

(12) $\forall P \forall e'[\text{Ipfv}(P)(e') \leftrightarrow \exists e[P(e) \wedge e' < e]$, where < is a proper part relation.

Application of Ipfv to a predicate P creates an event predicate that denotes parts of an event from the original extension of P. One can easily check that this new predicate is cumulative and not quantized, and can thus be combined with measure adverbials like *for an hour*. This is a welcome prediction of the theory, because it is exactly what happens with all non-culminating accomplishments in (1)–(9), regardless of whether they refer to failed attempts or to partially successful actions.

Krifka's approach contrasts sharply with modal accounts developed by Koenig and Muansuwan (2001), Bar-el et al. (2005), and Bar-el (2006), who point out that the extensional analysis based on the part-of relation does not suffice to account for non-culmination.

Koenig and Muansuwan (2001) assume that accomplishment stems in Thai are fundamentally imperfective in that they do not refer to complete eventualities to begin with, but to non-necessarily proper parts of such eventualities. In their system, lexical entries for all accomplishment stems contain a built-in imperfective operator, based on Dowty's (1977, 1979) notion of inertia worlds.

(13) Semantics for the imperfective operator (Koenig & Muansuwan 2001: 163).
   a. $\alpha = \text{Impfv}(ev, \phi)$
   b. An eventuality *ev* and an event description ϕ satisfy condition α iff there is an *e′* which (non-necessarily properly) includes *ev* and satisfies ϕ in all inertia worlds, i. e. in all worlds compatible with what it would mean to complete *ev* without being interrupted.

Similarities between this approach and Dowty's (1977, 1979) analysis of the progressive are evident. The reason for this seems to be fairly straightforward.

What non-culminating accomplishments and progressives have in common is the Imperfective Paradox: a proposition in all (b) examples in (1)–(9) can be true in the actual world without a corresponding proposition in (a) examples being true. A semantic representation of the non-culminating reading based on (12) fails to capture this characteristic, since a "complete" event, according to (12), must exist in the actual world. This suggests that main arguments for the intensional analysis of the progressive put forward in Dowty (1977, 1979) as well as in later developments of Dowty's approach (e.g., Landman 1992; Portner 1998) are applicable to non-culminating accomplishments, too. Specifically, in (13), unlike in (12) a complete eventuality exists in intertia worlds rather than in the actual world.

Bar-el et al.'s model is much in the spirit of Koenig and Muansuwan's proposal as far as the modal nature of non-culmination is concerned. Specifically, in St'át'imcets, the modal component is taken to be a part of the denotation of the transitivizer *–n* in (14) which creates transitive accomplishments out of unaccusative verb roots. Applying to an event predicate, *-n* introduces an agent and moves the culmination from the actual world to inertia worlds:

(14) The transitivizer
|| -n ||^{w} = $\lambda f_{\langle l,st\rangle}\lambda e$[e is controlled by its agent in w $\wedge$ $\forall w'$[w′ is an inertia world w.r.t. w at the beginning of e $\rightarrow$ $\exists e'$[f(e′)(w)) $\wedge$ e causes e′ in w′]]],
where l is the type of events.

For (11b), after the application of *-n* to the denotation of the unaccusative VP 'stem get fixed' projected by the unaccusative verb *máys* 'get fixed', the event predicate in (15) obtains:

(15) The denotation of tenseless and aspectless *v*P in (11b):
|| máys*en*lhkan ti q'láxana ||^{w} = λe[I am the agent of e $\wedge$ e is controlled by me in w $\wedge$ $\forall w'$[w′ is an inertia world w.r.t. w at the beginning of e $\rightarrow$ $\exists e'$[the fence gets fixed in w′(e′) $\wedge$ e causes e′ in w′]]]

(15) is (a characteristic function of) a set of events in which the speaker is an agent who exercises control over their development in the actual world. In every inertia world these events bring about a change of state of the fence, the fence getting fixed.[3]

3. Differences between these two systems are by all means less significant than fundamental similarities just mentioned. For instance, while Koenig and Muansuwan pre-associate their Impfv operator with a verbal stem in the lexicon, Bar-el's modal operator is taken to be a denotation of a derivational morpheme. (For Salish languages, this move is independently motivated by the fact that transitive accomplishments in these languages are always derived from unaccusative achievements, see Bar-el et al. 2005 and references therein.) Note as well

2.3 Problems for the partitive theory

2.3.1 *One- vs. two-operator approaches*

All the theories outlined so far do capture in some way the intuition that non-culminating accomplishments involve 'parts' or 'stages' of complete eventualities from the extension of an original verbal predicate. However, here the partitive approach faces a fundamental problem. Non-culmination is what failed attempts in (1b)–(4b) and partially successful actions in (5b)–(9b) have in common. Whatever analysis of the partitive/imperfective/inertia modal operator we adopt, it is not clear how to derive the failed attempt reading for (1b)–(4b) without obtaining the same result for (5b)–(8b). Similarly, if the operator is able to derive the partial success interpretation for (5b)–(8b) it is not obvious why the same operator produces a different reading for (1b)–(4b). Even more problematic is (9): the result of the application of the operator must be compatible with both failed attempt and partial success scenarios.

At this juncture, one can take different directions. The first is: failed attempts and partially successful actions are derived by different operators, say *FA* and *PS*. These operators should be semantically alike in order to account for the very fact that failed attempts and partially successful actions both involve non-culmination. Both should be partial functions whose domains (verb or VP denotations) do not coincide (given that for (1)–(8) only one non-culminating interpretation is available).

As a rough analogue of *FA* and *PS* one could think of English weak quantifiers *many* and *much*: the former applies to plural nouns, the latter takes mass nouns, and both express virtually the same meaning. This example suggests immediately what kind of difficulty we can face in pursuing this approach. Domains of *many* and *much* have different lattice-theoretic structures (Link 1983 and much subsequent work): the former contains pluralities constructed out of atoms, while the latter is non-atomic. There does not seem to be an equally well-motivated distinction between domains from which verbs like 'tear' in (1) and verbs like 'plow' in (5) take their denotations. One further difficulty for this approach is that domains of *FA* and *PS* (unlike those of complementarily distributed *much* and *many*) should intersect — otherwise it would be difficult to capture ambiguity of examples like (9). Obviously, this is one more potential sourse of ad hoc stipulations.

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that Bar-el's system, unlike Koenig's one, involves predicate decomposition into activity performed by the agent and change of state of the theme connected by a causal relation established in inertia worlds. Discussing these differences in more detail will take us too far from the main topic of this study, however.

Another option does not seem to suffer from these difficulties. We can assume a single operator extracting parts of complete eventualities as occurring in the actual world and guaranteeing that the culmination only exists in inertia worlds (or in whatever possible worlds our favorite theory solving the imperfective paradox tells us). In this case, the operator will be a total function, whose domain contains all verb denotations, but, depending on the properties of subdomains, this function will yield different non-culminating readings. Under this approach, the difference between failed attempts and partially successful actions should exist before event predicates combine with the partitive operator. It will be rooted in different semantic representations of corresponding verbs/verbal predicates, and the partitive operator will merely pass this difference on. In what follows, we will pursue exactly this type of approach.

2.3.2 *One-operator approach: Morphological evidence*

One-operator approach finds an empirical support from the morphological make-up of verbs in Russian. In Russian, both failed attempts and partially successful actions are derived by the same pieces of morphology. Look at two non-culminating verbs in (4b) and (8b) again:

(16) a. = (4b) *Vasja* ***po-otkry-va-l*** *dver'*...
v. DELIM-open-IPFV-PST.M door.ACC
'Vasja tried to open the door for some time.'

b. = (8b) *Vasja* ***po-zapoln-ja-l*** *anket-u.*
v. DELIM-fill-IPFV-PST.M form-ACC
'Vasja spent some time filling in the form.'

In both cases, non-culminating readings come with the so called delimitative verbs (see Mehlig 2003, 2006 for their detailed description and Filip 2000, 2005 for a possible analysis). Morphologically, derivation of these verbs involves two steps. First, an accomplishment stem (*otkry-* 'open' and *zapoln-* 'fill in' in (16a–b), respectively) merges with the so called "secondary imperfective" morpheme (*-va-* in (16a), *-(j)a-* in (16b)) and secondly, the resulting stem is combined with the prefix *po-*. The fact that both types of non-culminating accomplishments are derived in the same way and both bear the same piece of secondary imperfective morphology strongly suggests that the single operator is responsible for both readings. (Culminating eventualities in (4a) and (8a), in contrast, are referred to by original accomplishment stems that lack the secondary imperfective morphology: *otkry-l* 'open' in (4a) attaches the past tense inflection *-l* directly, and in *zapoln-i-l* 'filled in' the theme vowel *i* only occurs between the stem and inflection.)

Other languages in (1)–(10) do not exhibit a morphological distinction between culminating and non-culminating accomplishments (like that between

otkryl and *pootkryval* in Russian), nor between different types of non-culmination. In Karachay-Balkar, Mari, and Bagwalal the simple past verb form is associated with the whole range of possible readings. Crucially, we are aware of no language in which failed accepts and partially successful actions are morphologically distinguished. But if the two-operator approach to non-culmination is correct, that is exactly a kind of language we expected to find.

We can conclude, therefore, that whenever a language allows non-culminating accomplishments, a morphological distinction, if any, will be between culminating and non-culminating readings, not between FA-accomplishments and PS-accomplishments. This generalization falls out naturally from the single-operator approach but is not easily captured by the two-operator approach.

For the single-operator approach to work, we need, therefore, an articulated analysis of the internal structure of verbal predicates based on FA-accomplishments like 'open', 'wake up' and 'tear' in (1)–(4) vs. PS-accomplishments like 'sew', 'write', 'plow' and 'fill in' in (5)–(8). The rest of this paper will be mainly devoted to developing such an analysis.

2.4 The partitive theory and perfectivity

A note on the notion of imperfectivity is due at this point. Krifka (1998) maintains that extracting parts of eventualities from the original denotation of an accomplishment predicate is essentially imperfectivization. However, we believe that for the languages under discussion this suggestion is not tenable. Russian material is again instructive here. In (16a–b) the perfectivizing prefix *po-* is attached above the imperfective stems *otkr-yva-* and *zapoln-ja-*, creating delimitative verbs. Delimitative verbs are perfective, as is extensively discussed in the literature on Russian aspect (Isachenko 1960; Zaliznjak & Shmelev 2000; Filip 2000, 2003; Mehlig 2003, 2006, to cite only a few). They pass all diagnostics for perfectivity, e.g., the test on temporal interpretation of the Present tense and on co-occurrence with the future auxiliary:

(17)

	Imperfective	Perfective	Delimitative
Future time reference in the Present tense	*	√	√
Compatibility with the future auxiliary	√	*	*

Other non-culminating accomplishments in (1)–(8) are perfective, too. Consider (18) from Bagwalal:

(18) *ʕali w-a:-w-qʷaLi pat'imati-r čera saʕati-r gur q'ini.*
a. M-come-M-TEMP P.-ERG two hour-ERG dress sew.PST
1. 'When Ali came, Fatima spent two hours sewing a dress.'
2. *'When Ali came, Fatima was sewing a dress for two hours.'

(18) does not support the interpretation (18.2) in which the running time of the sewing event includes that of the coming event referred to by the adverbial clause. (18) is only true if coming temporally precedes sewing, as in (18.1). Evidently, this would have never been the case if the imperfective viewpoint aspect were a part of the meaning of the main clause. In contrast, temporal sequencing of events in (18) follows naturally if *q'ini* 'sewed' is perfective.

Therefore, the operator creating non-culminating accomplishments does not introduce the imperfective viewpoint aspect. Rather, in the above examples the output of the application of this operator serves as input to the *perfective aspectual operator*. Among other things, this strongly suggests that non-culmination and perfectivity/imperfectivity are to be kept distinct. Koenig and Muansuwan and Bar-el et al. independently make a similar point. Specifically, Koenig and Muansuwan (2001) suggest that their Impfv operator stands in the feeding relation with what they call semi-perfectivity. Bar-el et al. explicitly analyze non-culminating accomplishments in St'át'imcets as having perfective viewpoint aspect whereby the running time of an event is included in the reference time. Moreover, to avoid terminological confusion they propose to characterize non-culmination in terms of *inertia modality* rather than imperfectivity. The notion of viewpoint aspect involving the perfective/imperfective opposition, they argue, should be reserved to refer to relations between a running time of event and a reference time. Following their generalizations, as well as evidence from the morphological makeup of verbs in Russian, in what follows we assume the following hierarchy of functional heads:

(19) [… [$_{\text{AspP}}$ (IM)PERFECTIVE/PERFECTIVE [$_{\text{CmP}}$ CONTINUATION MODALITY [$_{\text{vP}}$ … *v* … […]]]]]

In (19), there are two distinct functional heads dominating *v*P. One is (Viewpoint) Aspect, another is Continuation Modality that projects a phrase the Asp head takes as a complement.[4] The term "*continuation modality*" replacing Bar-el at al's inertia modality is connected to the notion of continuation branch from Landman (1992). Landman's analysis of the progressive will be one of the ingredients of our account of non-culmination in Section 4, hence our terminological choice — continuation rather than inertia.

4. If one thinks of the semantic interpretation of functional heads in terms of "oppositions", one remarkable difference between Aspect and Continuation Modality should be pointed out. Aspect involves an equipollent opposition between perfective and imperfective meanings. In contrast, the CM head realizes a privative opposition – that between continuation modality and lack of continuation modality.

Given (19), examples like (16) would be analyzed as in (20), where the *–yva-* morpheme, traditionally labeled as imperfective, is treated as an exponent of the Continuation Modality head:

(20) [… [$_{\text{AspP}}$ *po-* [$_{\text{CmP}}$ *–yva-* [$_{v\text{P}}$ ... Vasja otkry- dver' ... 'v. open a/the door']]]]

Let us take stock of what we have observed so far. FA-predicates are instances of non-culminating accomplishments, other instances being PS-predicates and non-restricted predicates. Non-culmination leads to an imperfective paradox thus calling for a modal analysis. Existing theories of non-culmination posit a single operator doing the job for all instances of non-culmination, and we saw a good empirical evidence behind this single-operator approach. However, by itself a single operator is not able to distinguish between the failed attempt interpretation, partial success interpretation, and other non-culminating interpretations, if any. Given that verbs in (1)–(4) and (5)–(8) do not show any morphosyntactic difference and bear the same inflectional and derivational morphology, the observed contrast can only be attributed to their lexical representations. To this issue we now turn.

3. Analyzing accomplishments

3.1 The difference

Intuitively, what makes failed attempts different from partially successful actions is how the agent's activity is related to the change of state of the theme induced by that activity. Partially successful actions (e.g., (5b) repeated as (21a)) are construed in such a way that any contextually relevant part of the activity produce some change of state of the theme.[5]

(21) a. *alim eki saʁat baxca-nɨ̇ sür-dü.*
A. two hour field-ACC plow-PST.3SG
'Alim was involved in plowing the field for two hours.'

b. *fatima eki minut xalɨ̇-nɨ̇ zɨ̇rt-tɨ̇.*
F. two second thread-ACC tear-PST.3SG
'Fatima tried to tear a thread for two minutes.'

5. Relying on contextual relevance allows to "skip" those parts of the activity that "do not count". For instance, in could be the case that as plowing goes on, the plowman stops to fix the plow. Apparently, fixing the plow does count as a part of is the overall eventuality of plowing the field, but for obvious reasons it is irrelevant for the change of state of the field.

Although it is not the case in (21a) that the field has been plowed to completion, it has undergone some change — merely by virtue of the fact that some plowing activity has been performed. In contrast, as far as failed attempts are concerned, non-final parts of activities do not produce any change at all. If the event in (1a), repeated as (21b), had culminated, the whole change of state of the thread would have occurred at the very final part of tearing activity. But the activity stops before the culmination, and at that point the thread is still in its initial state.

At this juncture, several ways of capturing the intuitive difference between PS-verbs and FA-verbs seem to be open. Accordingly, before developing our proposal in Section 4 we will discuss and reject two main alternatives, a non-decompositional theory of accomplishments in Section 3.2 and causative decomposition theory in Sections 3.3–3.4.

3.2 Non-decompositional theory of accomplishments

Within standard Davidsonian or neo-Davidsonian frameworks, accomplishments are analyzed as monadic event predicates. Assuming that *v*Ps denote event predicates created when all individual argument positions of the verb are saturated, and representing for simplicity DP arguments as individual constants, for (21a–b) we get (22) and (23) respectively (where (b) examples contain Davidsonian and (c) examples — neo-Davidsonian representations):

(22) a. [$_{vP}$ alim baxca-nɨ sür- 'Alim plow the field']
b. λe[plow(field)(alim)(e)]
c. λe[plow(e) ∧ agent(alim)(e) ∧ theme(field)(e)]

(23) a. [$_{vP}$ fatima xalɨ-nɨ zɨrt- 'Fatime tear the thread']
b. λe[tear(thread)(fatima)(e)]
c. λe[tear(e) ∧ agent(fatima)(e) ∧ theme(thread)(e)]

The problem with (22)–(23) seems to be clear. Tearing and plowing events are treated on a par. Both are conceived of as a single indivisible whole, without separating activity performed by the external argument and change of state undergone by the internal argument. As a consequence, (22)–(23) do not impose any explicit restrictions on how activity is related to the change of state. Suppose that the denotation of event predicates in (23b–c) contains tearing events in which the activity immediately precedes the change of state. If so, why is the same temporal constitution not available for events in the denotation of event predicates in (22b–c)? Why can't it be the case that (22b–c) contain plowing events in which the whole agent's activity temporally precedes change of state of the field? The other way round, if plowing events are construed as involving gradual change of state that temporally coincide with the activity, why should tearing events in (23) be incompatible with

the similar scenario whereby the agent tears a thread gradually, parts of the change of state being mapped onto parts of the activity? Common sense suggests that this would not be a possible tearing-a-thread event, but (23) does not tell us why this should be the case.[6]

If we want to get round this problem while sticking to representations like (22)–(23), one way of doing so is to capture the difference between 'tear' and 'plow' in terms of the relation between events and their internal arguments.

The verb 'plow' is an incremental theme/gradual patient verb in the sense of Krifka (1989, 1992, 1998): its internal argument stands in the incremental relation to the event. Specifically, 'plow' possesses the Mapping to Subobjects property (MSO) in (24a):

(24) a. $\forall R[MSO(R) \leftrightarrow \forall x \forall e \forall e'[R(x)(e) \wedge e' < e \rightarrow \exists x'[x' < x \wedge R(x')(e')]]]$

According to (24a), a relation *R* between individuals and events shows mapping to subobjects iff whenever an object *x* stands in the relation *R* to an event *e*, for every proper part of *e*, *e′*, there is a proper part of *x*, *x′*, that stands to *e′* in the same relation. From this property, the following meaning postulate for 'plow' is easily derivable:

(24) b. $\forall y \forall x \forall e[plow(y)(x)(e) \rightarrow \forall e'[e' < e \rightarrow \exists y'[y' < y \wedge plow\ (y')(x)(e')]]]$

This postulate says that if, e.g., a field is plowed (by x) in the event *e*, then in any subevent of *e* some proper part of that field is plowed (by x). Apparently, that is exactly what we need to account for the partial success reading available for 'plow' — recall that in any incomplete plowing event some part of the field is obligatorily plowed.

'Tear', then, has an opposite property. If a thread is torn in an event *e*, then neither the thread itself nor any of it's proper parts are torn in any subevent of *e*:

(25) a. $\forall y \forall x \forall e[tear(y)(x)(e) \rightarrow \forall e'[e' < e \rightarrow \neg \exists y'[y' \leq y \wedge tear(y')(x)(e')]]$

(25a) ensures that nothing happens to a thread unless the whole event develops from the very beginning to the very end. From this property, one can argue, the failed attempt reading is derivable. On the non-culminating interpretation of 'tear a thread', the partitive operator extracts a proper part *e′* of an event *e* from the denotation of (23b) or (23c), and due to (25a), the thread is not torn in *e′*.

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6. Note that Kratzer's (2003) approach that assumes Davidsonian association of the internal argument but neo-Davidsonian association of the external argument (viz., for (21), $\lambda e[tear(thread)(e) \wedge agent(fatima)(e)]$) runs into the same complication and thus cannot be regarded as a better alternative.

Generalizing over this case, we can say that for verbs like 'tear' the relation between the event and theme arguments possesses an Anti-Mapping to (Sub)objects property (AMSO) in (25b):

(25) b. $\forall R[AMSO(R) \leftrightarrow \forall x \forall e \forall e'[R(x)(e) \wedge e' < e \rightarrow \neg \exists x'[x' \leq x \wedge R(x')(e')]$

(25) says that a relation R shows anti-mapping to subobjects iff whenever an object *x* stands in the relation R to an event *e*, no part of *x* stands in the same relation to any proper part of *e*.

MSO and AMSO successfully distinguish between verbs like 'tear' and verbs like 'plow'.[7] Furthermore, by not assigning either of the corresponding postulates for non-restricted verbs like *oj* 'destroy, take down, crumble' in (9), we make these verbs underspecified as to the relation between the event and the internal argument thus accounting for the fact that they share properties of 'tear' and 'plow'.

An essential premise behind this analysis is that whatever we have to say about the relation between activity and become subevents can be redescribed in terms of the relation between the overall eventuality and its theme participant. Neither AMSO nor MSO determine how the progress of the activity corresponds to a change of state brought about by that activity. Rather, both relate the part structure of the whole eventuality (comprising both activity and change of state) to that of the internal argument. And this is where a problem for the non-decompositional theory of accomplishment event structure lies.

If our attention is limited to non-incremental verbs like 'tear' and incremental theme verbs like 'plow', the MSO/AMSO distinction works perfectly well. However, this approach faces a complication as soon as we take into account other types of incremental verbs for which the physical extent of the theme is irrelevant for tracking the progress of the event. One example are so called degree achievement verbs like 'deepen', 'lengthen', etc. (see Dowty 1979; Hay et al. 1999; Kennedy & Levin 2002, 2008, among others). In languages like Russian, non-culminating readings are readily available for such verbs:

(26) *Rabočij-e* *po-uglubl-ja-l-i* *jam-u* *polčasa* *i*
worker-NOM.PL DELIM-deepen-IPFV-PST-PL pit-ACC for.half.an.our and
uš-l-i *obeda-t'*.
go.away.PFV-PST-PL have.lunch.IPFV-INF
'The workers were involved in deepening the pit for half an hour and went out for lunch.'

7. Note that no R can show both MSO and AMSO. However, there can be relations that show neither. Specifically, these are relations in which the whole internal argument is mapped into all subevents of the event. This is what happens with atelic predicates like *push (the cart),* where the whole cart stands in the theme relation to every subevent of a pushing event.

(26) refers to a partially successful action in which the depth of the pit increases a little, but the deepening activity stops before the depth reaches some intended (contextually salient) degree. Essentially, in (26) we are dealing with the same 'partial success' scenario as in (21a) with the verb 'plow'. But unlike on 'plow', on 'deepen' MSO fails: it is not the case that if the pit has been deepened by some degree d in the event e, then in every subevent of e some part of the pit was deepened by d. Rather, in every e', $e' < e$, the depth of the *whole* pit increases by some degree d', $d' < d$. This, of course, happens because evens in the extension of 'deepen' are incrementally related to gradable properties of theme participants (depth, in the case at hand), not to theme participants as such. To capture this, we will need some sort of Mapping-to-Degrees property, parallel to MSO (see Piñon 2008 for a similar idea).

The problem is that there can be even more entities incrementally related to eventualities (e.g., incremental paths, see Dowty 1991), and for every such an entity we may have to have a separate "Mapping-to-..." property (and, possibly, the whole family of corresponding "Anti-Mapping-to-..." properties as well). In this way, we end up by not having a natural class of verbal predicates that allow for a partial success interpretation. As a result, the observation that, e.g., both incremental theme verbs like 'plow' and degree achievement verbs like 'deepen' allow for a partial success interpretation would reflect two independent facts about distinct verb classes.

Evidently, this is not a welcome outcome of the analysis. If we could develop a theory of accomplishments in which all verbs that allow a specific type of non-culmination form a natural class, this would be a better option. But an attempt to describe relations between activity and become subevents in terms of another relation, that between the whole eventuality and some entity incrementally related to the eventuality, does not yield this result. Accordingly, in the subsequent sections we try another possibility: we will introduce a predicate decomposition theory whereby representations like (22b-c)–(23b-c) are replaced by those in which activity and become subevents are distinguished explicitly. Specifically, after reviewing in Section 3.3 a few current approaches to predicate decomposition, in Section 3.4 we will discuss what can be called *a causative decomposition theory*. After that, having rejected the causative decomposition, we will be ready to formulate our proposal in Section 4.

3.3 Predicate decomposition

The idea that accomplishments are inherently complex is not of course, new. At least since Dowty (1979) accomplishments are analyzed as involving at least two components: an activity/process performed by the agent/causer and change of state of the theme induced by this activity/process. Here come a few illustrations

about how (the relevant part of the meaning of) the sentence *John closed the door* would be analyzed within different decompositional theories, putting tense and grammatical aspect aside.

(27) Dowty (1979)
[[DO (John, [close(John)])] CAUSE [BECOME [closed (door)]]]

(28) Rappaport Hovav and Levin (1998)
[[John ACT] CAUSE [BECOME [door ⟨*closed*⟩]]]

(29) Kratzer (2000), Paslawska and von Stechow (2003)
$\lambda e \exists s$[agent(John)(e) ∧ close(e) ∧ CAUSE(s)(e) ∧ closed(the door)(s)]

(30) Pylkkänen (2002)
λe[agent(John)(e) ∧ $\exists e'$[closing(e′) ∧ theme(the door)(e) ∧ CAUSE(e′)(e)]]

(31) Ramchand (2002, 2003, 2008)
$\lambda e \exists e_2 \exists e_3 \exists e_4 \exists e_5$ [close-a(e_2) ∧ Causing(e_2) ∧ e = $e_2 \rightarrow e_3$ ∧ Subject(John)(e_2) ∧ close-p(e_4) ∧ Process(e_4) ∧ e_3 = ($e_4 \rightarrow e_5$) ∧ Subject(the door)(e_4) ∧ close-s(e_5) ∧ State(e_5) ∧ Subject(the door)(e_5)],
where "→" is a "lead to" or "cause" relation on events.[8]

(27)–(31) represent a very small part of proposals about predicate decomposition. But even within this small part one can observe a considerable degree of diversity. Analyses represented in (29)–(31) exploit event semantics, whereas (27)–(28) are eventless. As a consequence, the causal relation in (29)–(31) is a relation between events, while CAUSE in (27)–(28) is a two-place sentential operator. (27)–(31) differ as to how many propositional or eventive components the decompositional structure involves. Ramchand in (31) analyses accomplishments as consisting of three subevents (activity, change of state and result state), while others offer a two-component decomposition. (27)–(31) further differ in what the components of accomplishment structures are. In Dowty's original system further elaborated and extended by Rappaport Hovav and Levin, the caused component consists of a state embedded under BECOME. Kratzer (2000 and elsewhere) suggests that the causing activity and result state are directly connected by CAUSE with no BECOME. On the other hand, Pylkkänen (2002) proposes that accomplishments fall into two eventive components with no result state.

Evaluating a full range of predictions one can deduce from these differences goes far beyond the scope of this paper. Rather, we would like to focus on one

8. The representation in (31) contains equations of the type e = (e′→e″). Since literally the left-hand and righthand parts of the equation do not have matching logical types (e is of type s, e′→e″ is of type t), we interpret this expression as a shorthand for e = e′ ⊕ e″ ∧ e′ → e″.

aspect (27)–(31) have in common: components of all decompositional structures in (27)–(31) are causally related. All of them can thus be regarded as instances of the *causative theory of accomplishments*. Recall from Section 3.1 that the relation between activity and become subevents is exactly one we are after. Let us therefore look at the causative theory in more detail.

3.4 Causative theory

3.4.1 *Two problems*

Assume for the moment that accomplishments like 'tear a thread' and 'plow a field' are decomposed into two subevents along the lines of (32a–b) (putting the result state aside):

(32) a. $||$ John tear thread $|| = \lambda e \exists e' \exists e'' [e = e' \oplus e'' \wedge \text{tear}_{\text{ACT}}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{tear}_{\text{CS}}(e'') \wedge \text{theme}(\text{thread})(e'') \wedge \text{cause}(e'')(e')]$

b. $||$ John plow field $|| = \lambda e \exists e' \exists e'' [e = e' \oplus e'' \wedge \text{plow}_{\text{ACT}}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{plow}_{\text{CS}}(e'') \wedge \text{theme}(\text{field})(e'') \wedge \text{cause}(e'')(e')]$,
where $\oplus$ is the sum operator (Link 1983 and much subsequent work)

Both (32a) and (32b) denote events that are sums of causally related subevents. Let us therefore try to figure out if the causal relation will do for our purposes and what kind of problems we can face in pursuing the causal approach of accomplishments.

Kratzer (2005) argues extensively, following Ginet (1990), that two types of causal relations are to be kept distinct. First, an event *c* can *cause* the event *e*. Secondly, an event *c* may be a *causing* of the event *e*. The former relation between events obtains iff *c* is a minimal event in some causal chain with a maximal element *e*; the latter holds for *e* and *c* if *c* is the sum of all events in some causal chain with the maximal element *e*. Kratzer argues that the causing-of relation rather than cause relation is a part of the meaning of adjectival resultatives like *John drank the teapot empty* whereby John's drinking activity brings about the teapot's state of being empty. Adjectival resultatives do not allow that the causal chain connecting activity (e.g., drinking) and result state (e.g., being empty) contains intermediate causes that are not parts of that activity.

Evidently, the same argument can be applied to the causal relation in structures like (32). For 'John plowed the field' to be true, the causal chain leading to the change of state of the field cannot contain intermediate causes that has nothing to do with plowing activity. Similarly, 'John tore a thread' is not compatible with the scenario in which it is not Johns's activity that makes the thread tear, but some other event, only indirectly related to that activity. Therefore, we can safely assume that if a causal relation is a part of the meaning of accomplishments like 'plow' and 'tear' at all, it is the causing-of but not the cause relation.

However, there are reasons to doubt that the relation between subevents in (32a–b) can be reduced to causation. There are at least two problems with the causal analysis of accomplishments — problem of *temporal relatedness* and problem of *causal irrelevance*.

The problem of temporal relatedness rises because the causing-of relation between two events does not entail any specific type of temporal relation between them. Arguing against the causal analysis of accomplishments like 'read', Rothstein (2004: 104) points out that if *c* causes *e*, "it is usually agreed that we are entitled to assume that" *c* temporally precedes *e*, but for 'read' this is not a possible temporal relation between activity and become subevents.

Strictly speaking, this formulation may not be quite accurate. Nothing in the classic definition of causation going back to Lewis (1973), nor in its later developments including Kratzer (2005), suggest that the temporal precedence *must* be the case. But this definitely *can* be the case, and this is exactly what makes (32b) problematic. When one plows the field (sews a dress, plays a sonata, reads a book), activity and become subevents necessarily coincide in time. But, as it stands, (32b) does not (and in effect cannot) capture this essential characteristic of accomplishments like 'plow'.[9]

The problem of causal irrelevance rises with failed attempt verbs. Take 'wake up' as an example (see, e.g., (2) above). In (33), it is analyzed parallel to 'tear a thread' and 'plow a field' in (32):

(33) a. Masha woke up Ivan.

b. $||$ Masha wake up Ivan $|| = \lambda e \exists e' \exists e'' [e = e' \oplus e'' \wedge \text{wake}_{\text{ACT}}(e') \wedge \text{agent}(\text{Masha})(e') \wedge \text{wake}_{\text{CS}}(e'') \wedge \text{theme}(\text{Ivan})(e'') \wedge \text{cause}(e'')(e')]$

The crucial observation is that (33a) is compatible with two types of scenarios we could call a *totally causal scenario* and a *partially causal scenario*.

An example of the totally causal scenario for 'wake up' is as follows. Masha aims at waking up Ivan; she calls him in a whisper, and he wakes up immediately. In this case, the activity subevent is a calling-in-a-whisper and it is clearly this subevent that causes Ivan wake up. The event predicate in (33b) contains events that correspond to exactly this scenario.

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9. A similar problem has been mentioned by Beth Levin (2000). Discussing manner of motion to a goal and sound emission expressions (e.g., *Kim jogged to the store* and *Terry rustled into the room*), she argues that the causative analysis of such expression is unable to explain why jogging/rustling and going to the store/to the room are temporally coextensive: the former continues as long as the latter does.

A partially causal scenario for sentences like (33a) obtains if some components of the activity do not contribute to the change of state. Imagine that the agent, who aims at waking up Ivan, first calls him in a whisper, then calls him loudly, then claps hands at his ear, then shakes his shoulder. Finally, when she pours cold water on his face, Ivan wakes up.

The problem of causal irrelevance is that calling Ivan loudly, clapping hands and shaking his shoulder are not members of the causal chain leading to the waking up at all. Waking up does not casually depend on these (sub)events, since if they do not occur this has no consequences for the occurrence of waking up (sub)event. However, these subevents are clearly parts of waking up activity denoted by wake_{ACT} predicate in (33b). But according to (33b), the whole activity e' is a causing of the change of state e'', hence e' cannot contain any parts that are not members of the causal chain leading to Ivan's waking up. The partially causal scenario available for (33a) where most parts of the activity are causally irrelevant is not thus captured by (33b).

3.4.2 *Looking for solutions*

To get round the above problems one can offer a few improvements for the causal analysis of accomplishments but all of them seem to be stipulative to some extent. To solve the problem of temporal relatedness that rises for PS-accomplishments like 'plow', we can merely add the clause $\tau(e') = \tau(e'')$ to (32b) guaranteeing that running times of causally related subevents coincide:

(34) $||$ John plow field $|| = \lambda e \exists e' \exists e''$ $[e = e' \oplus e'' \wedge \text{plow}_{\text{ACT}}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{plow}_{\text{CS}}(e'') \wedge \text{theme}(\text{field})(e'') \wedge \text{cause}(e'')(e') \wedge \tau(e') = \tau(e'')]$,
where τ is a temporal trace function.

To deal with the problem of causal irrelevance one can argue that (33b) should be replaced by (35) in which the activity subevent, e', splits into two parts:

(35) $||$ John wake up Sue $|| = \lambda e \exists e' \exists e''$ $[e = e' \oplus e'' \wedge \text{wake}_{\text{ACT}}(e') \wedge \text{agent}(\text{John})(e') \wedge \text{wake}_{\text{CS}}(e'') \wedge \text{theme}(\text{Sue})(e'' \wedge \exists e'''[e''' \leq e' \wedge \text{fin}(e')(e''') \wedge \text{cause}(e'')(e''')]]$[10]

One of these parts, e''', is a causing of the change of state e'', while another part, the reminder of e', is irrelevant for causation. Furthermore, it seems reasonable to require e''' be a final part of the activity e'.

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10. (35) is based on a non-necessarily proper part relation '≤' between e''' and e′ rather than on a proper part relation '<' to guarantee that verbs like 'wake up' are compatible both totally and partially causal scenarios. Otherwise, a waking up event would necessarily contain parts of activity irrelevant for causation, which is not the case with totally causal scenarios.

At first sight, (35) contains everything we need to capture the meaning of accomplishments like 'wake up'. There are still problems with (35), however.

Firstly, the problem of temporal relatedness of causing and caused subevents we came across earlier is still here. (35) does not tell us how *e‴*, a causing part of the activity, is temporally related to *e″*, the change of state. In case of 'wake up' in (33a), *e‴* and *e″* must not temporally coincide but the causative relation does not guarantee temporal sequencing of the causing and caused subevents (in the same way as in (32b) it does not guarantee their temporal coincidence.). Again, the only way of obtaining the desired meaning is a stipulation. Thus, in (36), we require *e‴* and *e″* be temporally adjacent:

(36) || John wake up Sue || = $\lambda e \exists e' \exists e''$ [e = e′ ⊕ e″ ∧ wake_{ACT}(e′) ∧ agent(John)(e′) ∧ wake_{CS}(e″) ∧ theme(Sue)(e″) ∧ $\exists e'''$[e‴ ≤ e′ ∧ fin(e′)(e‴) ∧ cause(e″)(e‴) ∧ τ(e‴) ∝ τ(e″)]],
where '∝' is a temporal adjacency relation (see Krifka 1998: 206).

Secondly, and more importantly, having compared (36) with (34), we immediately discover that (34) and (36) taken together miss a significant generalization. There exists an implicational relation between temporal relatedness and causal irrelevance. PS-verbs like 'plow' *must* have temporally coinciding activity and change of state and *cannot* have parts of activity irrelevant for causation. FA-verbs like 'wake up', in contrast, *disallow* temporal coincidence but *do allow* that some parts of the activity do not cause any change of state. Therefore, if the activity temporally coincides with the change of state, it does not contain causally irrelevant parts.

But this fact, given (34) and (36), comes out as a pure coincidence, because the temporal relation between causing and caused subevents (τ(e′) = τ(e″) in (34) and τ(e‴) ∝ τ(e″) in (36)) is independent from whether the activity is a part of the causing subevent, as in (36), or is a causing subevent by itself, as in (34).

We conclude, therefore, that the decompositional analysis in terms of causing-of relation does not do the job for capturing genuine characteristics of verbs like 'plow' and 'wake up'. We need an alternative, and below we will try to develop such an alternative.

4. The proposal

4.1 Rothstein's theory of accomplishment event structure

In what follows we build on and extend Susan Rothstein's (2004) theory of accomplishment event structure briefly summarized in (37):

(37) Rothstein (2004): basic definitions

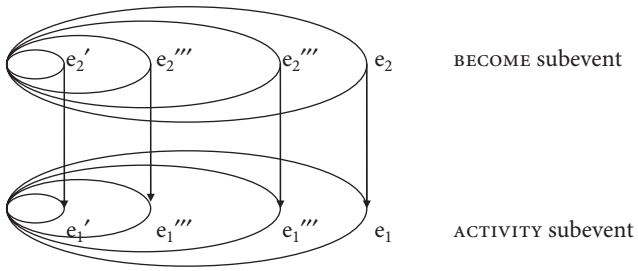
a. *Accomplishment event template*
$\lambda y \lambda e \exists e_1 \exists e_2$ [$e = {}^{S}(e_1 \cup e_2) \wedge$ ACTIVITY$(e_1) \wedge$ agent(e_1)=x $\wedge$ theme(e_1)=y $\wedge$ BECOME$(e_2) \wedge$ arg(e_2)=theme$(e_1) \wedge$ INCR$(e_1, e_2, C(e_2))$]
where ${}^{S}(e_1 \cup e_2)$ is a singular entity created out of e_1 and e_2

b. *Incremental relation between (sub)events*
INCR$(e_1, e_2, C(e_2))$ (e_1 is incrementally related to e_2 with respect to the incremental chain $C(e_2)$) iff there is a contextually available one-one function μ from $C(e_2)$ onto PART(e_1) such that $\forall e \in C(e_2)$ $\tau(e) = \tau(\mu(e))$

c. *Incremental chain*
C(e) is a set of parts of e such that
(i) the smallest event in C(e) is the initial bound of e,
(ii) for every e_1, e_2 in C(e) $e_1 \leq e_2$ or $e_2 \leq e_1$, and
(iii) e is in C(e)

In Rothstein's account, accomplishments are sums of two subevents, where the summing operation ${}^{S}(e_1 \cup e_2)$ creates a singular entity. Relevant subevents are activity (e_1 in (37a)) and become (=change of state, e_2 in (37a)). As (37a) shows, Rothstein provides neo-Davidsonian association of arguments with events via thematic roles. The activity subevent is related to the agent and patient, the single argument of the become subevent is equal to the patient of the activity subevent. Subevents are incrementally related. The INCR(emental) relation in (37b) is defined relatively to the incremental chain that consists of parts of the become subevent arranged in a partial order. The incremental chain, defined in (37c), is a set parts of an event such that any two parts stand in part-of relation. The incremental relation involves a contextually salient function that establishes a one-to-one correspondence between parts of the incremental chain and parts of the activity. This function replaces the causal relation between subevents more commonly accepted in the literature on predicate decomposition and discussed in the previous section. Related subevents must temporarily coincide. Event structure of accomplishments is schematically represented in (38):

(38)



In (38), e_2 is a become subevent, and e_2', e_2'', … are its parts arranged in an incremental chain. e_1 and e_1', e_1'',... are an activity subevent and its parts. Arrows represent a mapping established by the μ function from the incremental chain on e_2 into the set of parts of e_1.

4.2 Accomplishments vs. achievements

For Rothstein, the INCR relation is a defining property of accomplishments. In this way, her analysis captures characteristics of PS-verbs like 'read', 'sew', or 'plow'. However, she does not discuss in any detail predicates like 'tear a thread', 'wake up a person', etc. If such predicates are analyzed as denoting events that consist of two subevents, the relation between subevents cannot be incremental, since, as we saw earlier, in such cases we are dealing with the activity that up to its final point does not contribute to the development of the become subevent at all. Under the failed attempt interpretation, whatever activity is performed, the patient retains its initial state, cf. (4b) above and (39):

(39) Bagwalal (North Caucasian, Nakh-Daghestanian)

waša-šːu-r *čʼera* *saʕati-r* *hungar* *rũhã.*
boy-OBL.M-ERG two hour-ERG window open.PST
{Context: the lock upon the window is broken; the boy tries to open it.}.'The boy tried to open the window for two hours (and gave up).'

Within Rothstein's system, one solution would be to treat such verbs as achievements, that is, as predicates denoting simplex eventualities only containing a become subevent. But apart from the observation in Section 3.2 that a single-event analysis does not look plausible for this type of verbs, it should be noticed that FA-verbs in languages like Bagwalal, Mari, Balkar and Russian pattern with genuine Rothstein's accomplishments rather than with achievements. The crucial piece of evidence is that while both FA-verbs and PS-verbs do allow for non-culminating readings (see (1)–(9)), true achievements, e.g., 'arrive' in (40), do not.

(40) * *Pojezd* *po-priby-va-l* *na* *stancij-u* *pjatʼ* *minut.*
train DELIM-arrive-IPFV-PST.M at station-ACC five minute.GEN.PL
lit. 'The train arrived at the station for five minutes.'

We have every reason to suggest, therefore, that FA-verbs like 'wake up' and 'tear' are true accomplishments and not achievements. This calls for extension of Rothstein's account.

4.3 Mapping to a minimal final part

We argue that INCR is only one of the possible relations between activity and change of state (=become) subevents within the accomplishment event structure.

FA-predicates like 'wake up a person' and 'tear a thread' are associated with the same event structure as 'read a book' and 'plow a field' except for one thing: the relation between subevents is not INCR, but *Mapping to a minimal final part* (MMFP) defined in (41).

(41) MMFP(e_2)(e_1)

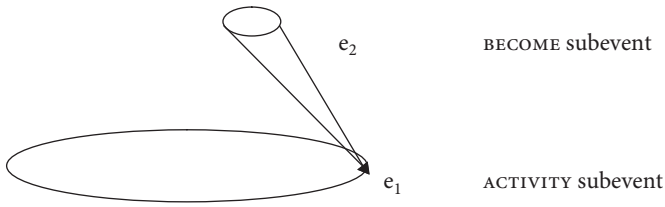
a. e_1 stands in the Mapping to a minimal final part relation to e_2 iff there is a contextually available function μ from e_2 onto PART(e_1) such that e_2 is mapped onto the minimal final part of e_1;

b. an event e′ is a final part of e iff $e' \leq e \wedge \neg\exists e'' [e'' \leq e \wedge e' \text{ « } e'']$ where « is a precedence relation on events (Krifka 1998: 207);

c. an event e′ is a minimal final part of e iff e′ is a final part of e $\wedge \neg\exists e''$ [e″ is a final part of e $\wedge$ e″ < e′]

The event structure of the FA-accomplishments is represented in (42):

(42)



Due to MMFP, nothing in the become subevent is mapped onto non-final parts of the activity subevent, and this is exactly what we need to capture the intuition that non-final parts of the activity do not contribute to the change of state.

4.4 Deriving non-culminating readings

4.4.1 *Failed attempts and partially successful actions*

Having distinguished INCR and MMPF, we can offer the following semantic representation for PS-accomplishments like 'plow' and FA-accomplishments like 'wake up':

(43) $|| \text{plow} || = \lambda y \lambda x \lambda e \exists e_1 \exists e_2 [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}_{\langle \text{plow} \rangle}(e_1) \wedge \text{agent}(e_1)=x \wedge \text{theme}(e_1)=y \wedge \text{Become}_{\langle \text{plowed} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{INCR}(e_2)(e_1)(C(e_2))]$

(44) $|| \text{wake up} || = \lambda y \lambda x \lambda e \exists e_1 \exists e_2 [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}_{\langle \text{wake.up} \rangle}(e_1) \wedge \text{agent}(e_1)=x \wedge \text{theme}(e_1)=y \wedge \text{Become}_{\langle \text{awake} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{MMFP}(e_2)(e_1)]$

Essentially, the difference between two types of accomplishments is reduced to the relation between activity and become subevents, exactly as the intuitive characterization in Section 3.1 suggests. PS-accomplishments involve Rothstein's incremental

relation, whereas FA-accomplishments are constructed by mapping the whole change of state to a minimal final part of the activity.[11]

Consider an example derivation of the failed attempt predicate in (4b) from Russian repeated as (45). For (45) we assume the syntactic representation in (46), where CmP stands for Continuation Modality phrase, as before:

(45) *Vasja* ***po-otkr-yva-l*** *dver'*.
v. DELIM-open-IPFV-PST.M door.ACC
'Vasja tried to open the door.'

(46) $[_{TP}$ -l $[_{AspP}$ po- $[_{CmP}$ -va- $[_{vP}$ Vasja otkry- dver' 'V. open the door']]]]

Assuming that the verb stem *otkry-* 'open' is analyzed as in (47), in the same way as 'wake up' in (44), after saturating argument positions we get the event predicate in (48) as a denotation of *v*P:

(47) $|| [_V$ otkry-$] || = \lambda y \lambda x \lambda e \exists e_1 \exists e_2$ [$e = {}^S(e_1 \cup e_2) \wedge$ Activity$(e_1) \wedge$ agent(e_1)=x $\wedge$ theme(e_1)=y $\wedge$ Become$_{\langle open \rangle}(e_2) \wedge$ arg(e_2)=theme$(e_1) \wedge$ MMFP$(e_2)(e_1)$]

(48) $|| [_{vP}$ v. otkry- dver'$] || = \lambda e \exists e_1 \exists e_2$ [$e = {}^S(e_1 \cup e_2) \wedge$ Activity$(e_1) \wedge$ agent(e_1)=Vasja $\wedge$ theme(e_1)=door $\wedge$ Become$_{\langle open \rangle}$ $(e_2) \wedge$ arg(e_2)=theme$(e_1) \wedge$ MMFP$(e_2)(e_1)$]

Recall from Section 1 that delimitative verbs in Russian contain an overt exponent of the continuation modality head. Here the partitive analysis of non-culmination

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11. Representations in (43)–(44) imply that the relation between activity and become subevents is specified lexically at the V^0 level rather than derived compositionally at some higher phrasal level(s). Susan Rothstein (p.c.) turned our attention to examples that can be problematic for this view. For instance, while in (1b) 'tear a thread' is unambiguously a MMFP predicate that yields a failed attempt interpretation, there are also examples like (i) where 'tear a shirt' looks like a non-restricted predicate compatible with both FA and PS readings:

(i) *fatima beš minut štrɨq-nɨ zɨrt-tɨ*.
F. five minute shirt-ACC tear-PST.3SG
1. 'Fatima spent five minutes tearing a shirt.' ⟨partial successs⟩
1. 'Fatima tried to tear a shirt for five minutes (but the shirt was so firm that she soon gave up).' ⟨failed attempt⟩

Therefore, the membership of an accomplishment predicate in one of the classes identified above – FA, PS, or non-restricted – can at least partially be determined by the properties of the theme. In case of 'tear', due to different spatial constitution of shirts and threads the former do license the INCR relation, the latter do not. However, much further work is necessary to figure out what accomplishment verbs under what circumstances can produce different event structures with different theme arguments and how to provide a compositional account of the contribution of the theme. With this in mind, for the moment we assume representations like (43)–(44) as a certain idealization.

discussed in Section 2.2 comes into play. We suggest, in the spirit of the proposals discussed above, that the continuation modality operator CM applies to the denotation of *v*P in (48). We assume without further discussion that this operator is identical to Landman's (1992) progressive (PROG) operator mapping events onto their stages, except for one thing. Since a stage of the event *e* can be *e* itself, PROG allows the event to culminate in the base world.[12] CM, in contrast, maps events onto their *proper non-final stages*. Application of CM operator to (48) yields (49).

(49) $|| [_{CmP}$ -va- $[_{vP}$ V. otkry- dver']] || = $\lambda e'.CM(\lambda e \exists e_1 \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}(e_1) \wedge \text{agent}(e_1)=\text{Vasja} \wedge \text{theme}(e_1)=\text{door} \wedge \text{Become}_{\langle \text{open} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{MMFP}(e_2)(e_1)])(e')$

(49) denotes events that are proper non-final stages of complete opening events consisting of activity and change of state parts in which Vasja is the agent and the door is the theme. By definition, proper non-final stages do not contain final parts of events from the original extension of the event predicate denoted by *v*P. But due to MMFP, it is exactly the final part of opening event at which the change of state occurs. Consequently, the predicate in (49) denotes events in which the agent's activity does not yield any change of state. In this way, the 'failed attempt' reading obtains.

In contrast, if an INCR-accomplishment, e.g., 'plow' in (43) or 'fill in' in (8b) repeated as (50), undergoes the same derivation, this results in a predicate in (51):

(50) *Vasja* ***po-zapoln-ja-l*** *anket-u* *pjat'* *minut.*
v. DELIM-fill.in-IPFV-PST.M form-ACC five minute.GEN.PL
'Vasja spent five minutes filling in the form.'

(51) $|| [_{CmP}$ -ja- $[_{vP}$ V. zapoln- anketu]] || $e'.CM(\lambda e \exists e_1 \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}(e_1) \wedge \text{agent}(e_1)=\text{Vasja} \wedge \text{theme}(e_1)=\text{form} \wedge \text{Become}_{\langle \text{filled} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{INCR}(C(e_2))(e_2)(e_1)])(e')$

The crucial difference between (49) and (51) is that the latter contains the become subevent incrementally related to activity subevent. Accordingly, while (51) denotes not fully developed filling-in-the-form events, but their proper non-final stages, any such a stage due to incrementality will necessarily involve some change of state of the theme. This accounts for the partial success interpretation of *zapolnjat'* 'fill in' and other PS-verbs discussed in Section 1.

Finally, since non-culminating accomplishments we are dealing with are perfective, as we saw in Section 2.4, we suggest that a perfective operator applies to

12. We are indebted to Susan Rothstein for turning our attention to this issue.

event predicates in (49) and (51) mapping them into predicates over times. We assume, following Klein (1994) and much other work in the field, that perfective predicates denote times that include the running time of the event:

(52) $||\ \textsc{pfv}|| = \lambda P \lambda t \exists e[t \supset \tau(e) \wedge P(e)]$

In Russian, we take the delimitative prefix *po-* to be a morphological exponent of the perfective operator in (52) (see Filip 2000, 2005, and elsewhere for a different analysis of the delimitative prefix). Applying (52) to (49) yields a property of times in (53). (Application of PFV to the event predicate in (51) proceeds in exactly the same way; for the sake of space, we leave out a corresponding example.)

(53) $||\ [_{\text{AspP}}$ po- $[_{\text{CmP}}$ -va- $[_{v\text{P}}$ V. otkry- dver']]] $|| = \lambda t \exists e'\ [t \supset \tau(e') \wedge$
$\text{CM}(\lambda e \exists e_1 \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}(e_1) \wedge \text{agent}(e_1)=\text{Vasja} \wedge \text{theme}(e_1)$
$=\text{the door} \wedge \text{Become}_{\langle \text{open} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{MMFP}(e_2)(e_1)])(e')]$

For (1)–(3) from Karachay-Balkar, Mari, and Bagwalal, which are strictly parallel to (45) from Russian, but lack overt imperfective/continuation modality morphology, we suggest that non-culminating readings are derived in exactly the same way, assuming that the CM operator is covert and that the perfective operator is bundled with tense morphology.

4.4.2 *A rejected alternative: Accomplishment-to-activity shift*

Discussing non-culminating (atelic) interpretations that some INCR accomplishments (e.g., *read a novel*) allow in English, Rothstein (2004 and elsewhere) hypothesizes that such interpretations are the product of accomplishment-to-activity shift. Therefore, while the telic sentence in (54a) involves an accomplishment predicate in (55a), its non-culminating counterpart in (54b) is derived by a SHIFT operation in (55b).

(54) a. John read a novel in two days.
b. John read a novel for two days.

(55) a. $||$ John read a novel $|| = \lambda e \exists e_1 \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}_{\langle \text{read} \rangle}(e_1) \wedge$
$\text{agent}(e_1)=\text{John} \wedge \text{theme}(e_1)=\text{novel} \wedge \text{Become}_{\langle \text{read} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1)$
$\wedge\ \text{INCR}(e_2)(e_1)(C(e_2))]$

b. $\text{SHIFT}_{\text{ACCOMPLSHMENT} \rightarrow \text{ACTIVITY}}(||\ \text{John read a novel}\ ||) = \lambda e[$
$\text{Activity}_{\langle \text{read} \rangle}(e) \wedge \text{agent}(e)=\text{John} \wedge \text{theme}(e)=\text{novel}]$

Essentially, accomplishment to activity shift is an operation that eliminates information about the become subevent as well as about its relation to the activity subevent. The output is a simplex activity predicate like that in (55b) that denotes activities, not accomplishments.

Suppose that such a shift functions as a universal mechanism of creating non-culminating interpretations. This would suggest that the derivation of non-culminating accomplishments does not involve the CM operator (nor any other operator of a similar sort required by the partitive theory of non-culmination) and that no continuation modality head is located in between *v* and Asp, as in (56):

(56) $[_{\text{AspP}}\ \textsc{pfv}\ [_{v\text{P}} \ldots \text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}\ (\ldots)\ \ldots\ ]]$

Unlike in English, where $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$ only applies to a subset of INCR accomplishments (e.g., to *read a novel*), in languages under discussion this operation should be available for all non-culminating predicates, including INCR and MMFP accomplishments (see Section 5 for the discussion of cross-linguistic variation in the domain). If so, non-culminating perfective MMFP accomplishments like (45) would have the semantic representation in (57):

(57) $||\ [_{\text{AspP}}$ Vasja po-okryva- dver'$]\ || = \textsc{pfv}(\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$ $(||\text{v. open door}||)) = \lambda t \exists e\ [t \supset \tau(e) \wedge \text{Activity}_{\langle\text{open}\rangle}(e) \wedge \text{agent}(e)=\text{Vasja} \wedge$ theme(e)=the door]

(57) differs from (53) in a number of respects. The most significant one is of course that (53) does contain information about the culmination. (53) entails that the opening event *does not reach* culmination in the base world (it only happens in a world on the continuation branch of the event with respect to the base world, see Landman 1992 for details). (57) makes explicit that the event *does not have* culmination *in any world*, since opening-the-door is a plain activity (like, e.g., 'push the cart'). Even putting aside the question if such an analysis is intuitively plausible, we could mention two complications it produces.

First, $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$ is an operation that violates Monotonicity. Essentially, Monotonicity is a universal constraint on morphosyntactic operations saying that such operations cannot destroy semantic structure. Koontz-Garboden (2007) has recently shown that even the most challenging data (e.g., anticausativization) observed across languages are fully compatible with Monotonicity. $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$, however, is precisely an operation that removes pieces of structure originally present in the semantic representation, hence, other things being equal, is not a desirable option.

Secondly, and most significantly, if one adopts $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$ the question we started with in Section 3.2, rises again immediately: why sentences like (45) in Russian refer to failed attempts, whereas sentences like (50) to partially successful actions?

The analysis developed in Sections 4.1–4.4.1 attributes the difference between FA- and PS-accomplishments like 'open the door' and 'fill in the form'

to different relations between activity and become subevents, MMFP and INCR. But $\text{SHIFT}_{\text{ACCOMPLSHMENT}\rightarrow\text{ACTIVITY}}$ removes exactly this information, yielding the same representations in both cases:

(58) a. $\lambda e\ [\text{Activity}_{\langle \text{open} \rangle}(e) \wedge \text{agent}(e)=\text{Vasja} \wedge \text{theme}(e)=\text{the door}]$
b. $\lambda e\ [\text{Activity}_{\langle \text{fill.inf} \rangle}(e) \wedge \text{agent}(e)=\text{Vasja} \wedge \text{theme}(e)=\text{the form}]$

In (58), MMFP predicates like 'open the door' and INCR predicates like 'fill in the form' are strictly parallel, and it is not clear why nothing happens to the door in (45) but something happens to the form in (50). This is our main reason to believe that (49) and (51) derived by the CM operator that preserves information about MMFP and INCR relations is superior to (58a–b).

4.5 Advantages and further questions

A few additional comments are due at this point. A significant advantage of the analysis outlined so far is that it faces none of the problems of the causative decomposition theory discussed in Section 3.4. The problem of temporal relatedness disappears because, unlike the causal relation, both INCR and MMFP specify the temporal structure of accomplishments directly.

The problem of causal irrelevance that shows up with partially causal scenarios available for FA- verbs like 'wake up', is effectively solved, too. The semantic representation of FA-accomplishments ('wake up' in (44), in particular) does not involve a causal relation between subevents at all, hence does not specify what parts of activity contribute causally to the change of state. The change of state must happen at the minimal final part of the activity — that is all that is required by (44). In this way, (44) is fully compatible with both totally causative and partially causative scenarios discussed in 3.4, and this is a desired result. Finally, the fact that PS-accomplishments cannot involve parts of activities irrelevant for bringing about the change of state falls out as well: due to the INCR relation, the activity subevent cannot contain parts left unassociated with the become subevent.

However, there are two more questions to address: whether the become subevent in the denotation of FA-accomplishments like 'wake up' is structured by the incremental chain, and what kind of contextual information is involved in their interpretation.

4.5.1 *The problem of the incremental chain*

One can observe that the MMFP relation in (41), unlike the INCR relation in (37b–c) does not involve the incremental chain generated by the become subevent. This move reflects a significant intuition: unlike for PS-accomplishments,

for FA-accomplishments the become subevent is construed as lacking internal complexity.

An alternative way of defining MMFP would be as in (59):

(59) MMFP(e_2)(e_1)(C(e_2))

e_1 stand in the Mapping to the minimal final part relation to e_2 with respect to the incremental chain C(e_2)) iff there is a contextually available function μ from C(e_2) into PART(e_1) such that every (sub)event in C(e_2) is mapped onto the minimal final part of e_1.

There are three pieces of evidence supporting our hypothesis that (41) is superior to (59).

First of all, the developmental structure of the become subevent of FA-accomplishments is not accessible for semantic operations. Take 'wake up' as an example again. We have seen that in languages under consideration this verb can produce two types of interpretation — culminating (telic) and non-culminating (failed attempt). What is crucial is that in both cases we cannot make reference to the development of the become subevent, that is, to a situation when the patient has already left the state of being asleep but has not yet entered the state of being awake:

(60) = (2b) Mari (Uralic, Finno-Ugric)

a. *maša jivan-em lu minut-əšte kəčkər-ən.*
M. I.-ACC ten minute-INESS wake.up-PST
'Masha woke up Ivan in ten minutes.'

b. *maša jivan-em lu minut kəčkər-ən.*
M. I.-ACC ten minute wake.up-PST
'Masha tried to wake up Ivan for ten minutes.'

On the culminating reading in (60b), the change of state is already attained. On the failed attempt reading in (60b), the patient is still in the initial state. In both cases, the internal structure of the become subevent is not taken into consideration. This does not suggest of course that in the real world the transfer from sleeping to being awake does not involve identifiable phases. But this indicates clearly that information about these phases is not a part of the meaning of the verb like *kəčkər* in (60). If the incremental chain is taken to represent exactly this information, we should not have it in the definition of the MMFP relation.

Another piece of evidence has to do with the meaning shift that occurs in hitting-one-key contexts discussed by Verkuyl (1993: 48–49). Taking *John drew a circle* as an example, Verkuyl comments: "On a sophisticated computer, there are keys to touch in order to reach a result… By hitting the last key in a series of

drawing tasks on the keyboard, the circle can be produced at once, which would make it analogous to reaching the top or winning the race".

In normal contexts, 'draw' is a typical incremental theme verb, similar to 'plow', 'read' or 'play (a sonata)' and should be analyzed as denoting the INCR relation in Rothstein's system: indeed, under normal circumstances the circle comes into existence gradually. As such, INCR would involve reference to the incremental chain on the become subevent. What seems to happen in hitting-one-key contexts is replacing the INCR relation by the MMFP relation whereby the whole change-of-state subevent occurs when the last key is hit. But as soon as this shift happens, the circle need not come to existence gradually and can appear all at once.

It seems, therefore, that whether the become subevent is structured by the incremental chain depends on whether it enters the INCR relation. To enter the INCR relation, the become subevent must necessarily have internal structure. For the MMFP relation, its internal structure is irrelevant.

The strongest piece of evidence supporting our suggestion that the become subevent is not structured by the incremental chain if it is mapped to a minimal final part of the activity comes from causativization facts. Consider (61a–b) from Karachay-Balkar.

(61) a. *sɨrɨq eki saʁat-xa quru-du.*
dress two hour-DAT dry-PST.3SG
'The dress dried in two hours.'

b. *illew eki kün-ge sɨn-dɨ.*
toy two days-DAT break-PST.3SG
'The toy broke in two days.'

(61a–b) show non-derived intransitives *sɨn* 'break' and *quru* 'dry'. The latter is a punctual change of state verb while the former is a degree achievement. This is evidenced by the fact that (61a) entails that the dress was drying during two hours, but the (61b) does not entail that the toy was breaking during two days. In (61b) the breaking event occurs at the upper bound of the period referred to by the time-span adverbial. In the present system, this difference can be captured by assuming that parts of an event from the denotation of *quru* in (61a) form an incremental chain. In contrast, punctual or near-punctual achievements like *sɨn* 'break' lack this property and come therefore without internal developmental structure.

Causativization creates different types of accomplishment out of achievements in (62):

(62) a. *fatima sɨrɨq-ny eki saʁat quru-t-tu.*
F. dress-ACC two hour dry-CAUS-PST.3SG
'Fatima was involved in drying a dress for two hours' {e.g., by holding the heater near the dress, but the dress still remains a bit wet}.

b. *murat illew-nü eki saʁat sɨn-dɨr-dɨ.*
M. toy-ACC two hour break-CAUS-PST.3SG
1. 'Murat tried to break a toy for two hours' {but the toy was so firm that he finally gave up}.
2. * 'Murat was involved in breaking a toy for two hours' {so that when he stopped the toy was damaged but still not completely broken}.

The derived accomplishment *qurut* in (62a) based on the incremental achievement *quru* 'dry' does have the partial success reading, indicating that drying become-events can enter the INCR relation with the activity denoted by the causative morpheme (see Pylkkänen 2002 for the analysis of the causative as denoting the causing activity event). In contrast, (62b) demonstrates that the punctual achievement *sɨn* 'break' produces a MMFP-accomplishments *sɨndɨr* 'break' compatible with the failed attempt interpretation in (62b.1) but not with the partial success interpretation in (62b.2).

Assume that the event structure of causative verbs derived from achievements and that of non-derived accomplishments is the same (this assumption has extensively been discussed and motivated in the literature on causativization). If this assumption is correct, the fact that the MMFP relation is obligatory for FA-accomplishments like 'wake up' and 'tear' signals that the become subevent in their denotation is not structured by the incremental chain — exactly as in the case of the derived accomplishments *sɨndɨr* 'break'.

Given this evidence, we reject the definition of the MMFP relation in (59) in favor of (41).

4.5.2 *MMFP and contextual information*

Another significant question about the MMFP relation is whether the function μ that connects activity and become subevents should be made relative to the context, analogously to a corresponding function that builds denotations of INCR accomplishments (see (37b)), or its properties are fully determined by the lexical meaning of the verb itself. Rothstein's (2004: 111–112) motivation for contextualizing this function in case of the INCR relation consists of two parts, and neither is relevant for the MMFP relation.

First, for the INCR relation, the context determines which parts of the become subevent are in its incremental chain. For one and the same event predicate, e.g., *read the book*, as Rothstein points out, the incremental chain can contain parts of different size depending on who the agent is and what book is being read. Secondly, for derived accomplishments with resultative small clauses, e.g., *Mary sang the baby asleep* the context establishes an appropriate connection between (descriptive properties of) an activity and a change of state. Singing activity can naturally be connected to the baby falling asleep, but, Rothstein argues, it takes

much pragmatic effort from the speech act participants to establish a corresponding connection to, say, an eating activity. That is the reason why *Mary ate her baby asleep* requires a heavily loaded context to become acceptable.

For MMFP accomplishments, neither of these two types of contextual information is relevant. On the one hand, the MMFP relation, as has been just discussed, does not involve reference to the internal developmental structure of the become subevent. In this respect, nothing is left for the context to determine. On the other hand, MMFP accomplishments do not normally accept resultative secondary predications (see, e.g., Rappaport Hovav & Levin 1998 and elsewhere). Whatever reasons for this constraint are, it weakens significantly the second motivation for making the function μ dependent on the context.

However, contextual information is still involved in the interpretation of MMFP accomplishments, although in a different way. The context plays a significant role in determining descriptive properties of the activity subevent. As Rappaport Hovav and Levin (1998 and elsewhere) observe, verbs like 'break' (as well as 'tear', 'wake up' and other result verbs in their original terminology) specify characteristics of the result state in their lexical representation. Properties of the activity are left underspecified. Indeed, take our waking up example again. We saw that the agent's actions can vary to a great extent: calling the patient loudly, shaking her shoulder, pouring water on her face, clapping hands at her ear, playing trombone, as well as various sequences of these actions can all count as waking up activity. Evidently, the lexical meaning of the verb 'wake up' does not provide us with an exhaustive list of all possible activities and their combinations. Rather, it is through the context that we determine what are characteristics of the activity in any particular waking-up event. And here the contextualized character of the function μ in the definition of the MMFP relation is revealed: this function is responsible for picking up a contextually relevant activity for a particular become subevent.

4.6 Non-restricted accomplishments

To complete our analysis, we have to characterize non-restricted accomplishments like *oj* 'destroy, take down, crumble' in (9), repeated as (63):

(63) *išci* *eki* *kün/saʁat* *üj-nü* *oj-du.*
worker two day/hour house-ACC destroy-PST.3SG
1. 'The worker tried to take down the house for two days'. {But soon it became clear that it is not possible for a single person; so he gave up, not being able to remove a single brick}.
2. 'The worker was involved in taking down the house for two hours'. {He had already removed two walls, but was asked to stop}.

As we see, (63) is compatible with both failed attempt and partial success interpretations. Given the above discussion of FA-accomplishments and PS-accomplishments, the solution suggest itself. The peculiarity of verbs like *oj* in (63) is that the relation between subevents is not specified in the lexicon as rigidly as for verbs like 'plow', 'read', 'wake up' or 'tear'. For plowing events any portion of the change of state must be brought about by some simultaneous portion of the activity. For tearing events the whole change of state occurs at the final part of the activity. But for an event to count as a taking down event neither of these options is obligatory.

Technically, we suggest that the lexical entry of verbs like *oj* is underspecified as to the relation between subevents, as represented in (64), where R stands for a free variable over relations between two events and an incremental chain defined on one of them:

(64) $||\text{ oj }|| = \lambda y \lambda x \lambda e \exists e_1 \exists e_2\ [e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}_{\langle \text{destroy} \rangle}(e_1) \wedge \text{agent}(e_1)=x \wedge \text{theme}(e_1)=y \wedge \text{Become}_{\langle \text{destroyed} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge R(e_2)(e_1)(C(e_2))]$

A minor complication at this point is that only the INCR relation between two events and an incremental chain has an appropriate logical type to serve as a value for R. MMFP possesses a different type — that of relation between two events. This complication can be easily overcome by assuming an MMFP* relation, a counterpart of MMFP relativized to the incremental chain but only defined for degenerate incremental chains, that is, for singleton sets containing the whole become subevent:

(65) $\text{MMFP}^*(e_2)(e_1)(C(e_2))$ is only defined if $C(e_2)=\{e_2\}$. When defined, $\text{MMFP}^*(e_2)(e_1)(C(e_2))=1$ iff $\text{MMFP}(e_2)(e_1)=1$.

We suggest that the semantic derivation of clauses like that in (63) involves the same steps as before, that is, saturation of argument positions, and subsequent application of the continuation modality and perfective operators. Assigning either INCR or MMFP* as a value to R will finally produce a proposition compatible with failed attempt or partial success scenarios.

5. Intra- and cross-linguistic variation

One of the major issues not addressed so far is that of variation, both intra-linguistic and cross-linguistic.[13]

13. We are extraordinarily grateful to Susan Rothstein for encouraging us to discuss these problems here.

5.1 Intra-linguistic variation: Delimitative verbs in Russian

Intra-linguistic variation obtains if certain (classes of) accomplishments do not pattern with others as to the range of interpretations they have. Thus, so far we have shown that *if* an accomplishment predicate allows a non-culminating interpretation, *then* this will be a partial success, a failed attempt, or both. It may be the case, however, that in a given language, there are accomplishments that do not allow non-culminating readings at all. One of such languages is Russian. Consider (66):

(66) ?? *Vasja* ***po-rasstrel-iva-l*** *plenn-ogo.*
v. DELIM-shoot-IPFV-PST.M captive-ACC
'Vasja tried to shoot a/the captive (for some time, and gave up)'.
(Kisseleva & Tatevosov 2004)

Intuitively, the predicate 'shoot a captive' resembles MMFP accomplishments discussed so far in that the change of state occurs at the minimal final part of the activity. However, rather than yielding the FA-interpretation, this predicate produces no non-culminating reading at all: the delimitative clause in (66) is definitely odd. Mehlig (2003) cites a few other examples like (66), e.g., ??*po-vyda-va-t' knigu* 'give out a book' and ??*po-prinima-t' tabletku* 'take a pill'.

This is where a complication lies: our analsis, as it stands, does not predict awkwardness of (66). The CM operator (whose morphological exponent in Russian is, by hypothesis, the "secondary imperfective" morpheme *–(y)va-*) is expected to be able to apply to 'shoot a captive' yielding a predicate that denotes non-final stages of shooting-a-captive event. The perfective operator, denoted by the prefix *po-*, then, is expected to take the output and create a property of times that include the running time of some non-final stage of shooting. But in (66) this does not happen.

While not trying to offer an ultimate solution at the moment, we would like to mention a few facts that bear on the issue.

First of all, it can hardly be the case that the CM operator denoted by the *–(y)va-* morpheme fails to apply to the accomplishment predicate 'shoot a captive': the imperfective sentence containing the same material as (66) except for the delimitative prefix is perfectly grammatical. It refers to what it is expected to refer — to an activity (whose precise descriptive content is left underspecified) that precedes a final shot at the captive:

(67) *Vasja* ***rasstrel-iva-l*** *plenn-ogo.*
v. shoot-IPFV-PST.M captive-ACC
'(When I came,) Vasja was shooting a/the captive (e.g., he was taking aim when I saw him)'.

This suggests that there must be something more about the perfective operator denoted by the prefix *po-* than we have said in Section 4.4.1. Application of this operator should be restricted as to prevent it from combining with predicates like

CM(||shoot a captive||). The question is, then, where this restriction comes from. To put it differently: what do accomplishments like 'shoot a captive', 'give out a book', etc., that disallow non-culminating readings in Russian have in common?

Mehlig (2003 and elswhere) suggests that a relevant property that constrains application of *po-* is homogeneity. Delimitatives, he points out, can only be derived from predicates that refer to homogeneous situations in which "activity directed towards a goal can be interrupted and resumed arbitrarily many times; phases of a situation are conceptualized as identical". Assuming that this intuition is correct, the problem is how to make it clear in what sense activities in the denotation of FA-accomplishment like 'break a vase' in (68) are homogeneous, whereas those in the denotation of predicates like 'shoot a captive' in (66) are not:

(68) *Vasja* ***po-razbi-va-l*** *vaz-u.*
v. DELIM-break-IPFV-PST.M vase-ACC
'Vasja tried to break a vase (for some time, and gave up).'

On the appropriate context, the FA interpretation of (68) is perfectly felicitous: imagine a person who tries to break a vase from an unbreakable glass throwing it on the floor once, twice, three times, then hitting it with a hammer a number of times, then with a sledge hammer. After the sledge hammer fails to break a vase, the Agent gives up. Given this scenario, (68) is appropriate. (66), however, is bad on any scenario and cannot be repaired.

We do not see a straightforward way of telling 'break a vase' and 'shoot a captive' apart through characteristics like "an activity can be interrupted and resumed arbitrarily many times" or "phases of an activity are conceptualized as identical". If breaking a vase activity can be interrupted and resumed, why cannot shooting a captive? And if parts of shooting a captive are not conceptualized as identical, in what sense parts of breaking a vase (throwing on the ground, hitting with a hammer) are?

We believe that a more promising way of discerning the difference between predicates like 'shoot a captive' ('give out a book', 'take a pile',…) and 'break a vase' ('open the door', 'wake up Ivan',…) would rely on the observation that parts of activities in the denotation of the former are partially ordered in a way those in the denotation of the latter are not. Here is a brief outline of the idea. Assume that the activity component of MMFP accomplishments like 'shoot a captive' and 'break a vase' consists of contextually salient atomic subevents: loading a bullet, taking aim, pulling a trigger, firing a shot in case of 'shoot', and throwing on the ground, hitting with a hammer, hitting with a sledge hammer in case of 'break'. Then one can observe that for shooting-a-captive activity the set of such subevents is partially ordered by temporal precedence (e.g., pulling the trigger follows taking aim, and firing a shot follows pulling the trigger), and also by the causal dependence (e.g., it is not possible to fire a shot without loading a bullet and to hit the target without

taking aim). Furthermore, the change of state induced by the activity is causally dependent on most (if not all) of its components: it is not possible to shoot a captive without loading a bullet, without taking aim, etc. The same is true of activities referred to by 'give out a book' and 'take a pile'. They are sequences of actions such that if they are performed in incorrect temporal order or some of them are skipped, the overall sequence does not count as a giving-out-a-book or taking-a-pile activity anymore. Let us call activities like these inherently ordered, or IO-activities.

MMFP accomplishments that do possess the FA interpretation are different. As we saw in Section 3.4.1, where the problem of causal irrelevance has been discussed, predicates like 'wake up Ivan' refer to activities that do contain parts on which the change of state is not causally dependent. If the waking-up activity consists of calling the patient in a whisper, calling him loudly, clapping hands at his ear, shaking his shoulder, and pouring cold water on his face, the waking up only depends causally on the final subevent in this sequence. Nor do these subevents causally depend on each other: it is perfectly possible to shake one's shoulder without calling one in a whisper and vice versa. Their temporal sequencing is irrelevant either, except that the subevent that brings about the change of state must be final: if it is pouring the water that wakes up the patient, it does not matter in which order other subevents occur. Exactly the same is true of 'break a vase': if the change of state happens at the final part of the activity, the non-final minimal subevents in the sequence that makes up this activity have no pre-established temporal or causal ordering. Activity components of 'wake up Ivan' and 'break a vase' are thus not inherently ordered.

Therefore, being partially ordered rather than being homogeneous in a strict mereological sense is what makes the activity component of MMFP accomplishments like 'shoot a captive' different from that of MMFP accomplishments like 'break a vase'.

Given these observations, one can easily see that the application of the CM operator to two different types of MMPF accomplishments will have different consequences. The operator extracts non-final components of the activity as occurring in the base world. For 'break a vase', 'tear a thread', 'weak up Ivan', etc., the resulting event predicate will denote activities consisting of atomic subevents on which the change of state (not occurring in the base world) is not causally dependent, that are not causally dependent on each other and allow any temporal ordering.

For instance, for 'break a vase' the base world would contain non-final stages of the activity consisting of throwing to the ground, hitting with a hammer,…,…. These subevents can be arranged in any temporal order, and whatever subevent occurs, this does not contribute to the progress of the overall breaking-the-vase event, because the change of state does not causally depend on them. CM(||break a vase||) is this not inherently ordered.

Applying the CM operator to 'shoot a captive', 'give out a book', etc., would also extract a proper non-final stage of the activity. However, since the whole activity

is inherently ordered, the extracted part, CM(||shoot a captive||), CM(||give out a book||), etc., will be ordered, too. For CM(||shoot a captive||), for example, the base world can happen to contain loading a bullet and taking aim only. Still, these subevents has to occur in this exact order, and the overall shooting event will be causally dependent on both of them.

Note that the lexical meaning of INCR accomplishments, as Rothstein (2004) conclusively shows, does not impose any inherent ordering on the activity subevent either. It is only structured indirectly, through the mapping from the structured become subevent to the activity, as shown in (38). Accomplishments that do combine with *po-* — MMFP predicates like 'break a vase' and INCR predicates like 'read a book' or 'fill in the form' in (8b) — thus form a natural class: they denote complex events with the activity component not inherently ordered.

Technical elaboration of these generalizations goes beyond the scope of this paper. However, the descriptive generalization seems to be clear. The property that restricts the distribution of the perfective prefix *po-* is: the activity denoted by the CmP complement of *po-* (e.g., CM(||shoot a captive||), CM(||break a vase||), CM(||fill in the form||)) should not be inherently ordered. In (69) this is informally captured by combining the perfective operator PFV from (52) with the additional presupposition narrowing its domain:

(69) || *po-* || = $\lambda P \lambda t \exists e[t \supset \tau(e) \wedge P(e)]$
P denotes not inherently ordered activities

5.2 Cross-linguistic variation: Parameters and constraints

In Section 5.1, we have seen one example of *language-specific* variation. Much more complicated is the problem of defining the parameters of *cross-linguistic* variation in the domain and determining what the constraints on this variation are.

Susan Rothstein (p.c.) has mentioned two most significant manifestation of this problem: Why are non-culminating readings not derived in languages which do not allow them? Why might a language allow one of the non-culminating readings but not another? Rothstein cites the following examples showing that in perfective clauses non-culminating readings in English are not available for all MMFP predicates and for some INCR predicates:

(70) a. Ali plowed the field for two hours (and then went home for lunch).
b. I read this book for two weeks (before giving up half way through).
c. I sewed this dress for two days.
d. * I built the house for two weeks.
e. # I opened the door for five minutes (and then gave up)[14]

14. (70e) is appropriate on the iterative reading irrelevant for the present discussion.

Rothstein does not mention MMFP predicates with inherently ordered activity components, but to the best of our knowledge, these predicates do not admit the non-culminating interpretation either:

(71) # Ali shot a hostage for half an hour (and then gave up).

Rothstein (2004: 114–115) hypothesizes that the borderline between INCR accomplishments that do allow for non-culmination (e.g., in (70a–c)) and those that do not (e.g., in (70d)) is determined by the properties of the activity: the ploughing-the-field activity is homogeneous ("consists of the repetition of a single kind of events"), but building-the-house activity is not.

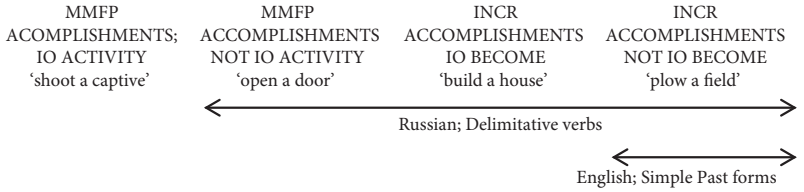
A little clarification may be in order at this point. As was mentioned above, Rothstein (2004) has established that the activity component of INCR accomplishments is not inherently ordered: it is the mapping from the become subevent that impose partial order on the activity, as shown in (38). If so, it is rather internal structure of the become subevent that tells accomplishments like 'build a house' apart from accomplishments like 'plow a field'. Whereas for the former the incremental chain consists of parts of the become subevent arranged in a partial order by the mere part-of relation, we have more to say about the latter. In case of *build*, members of the incremental chain seem to be ordered not only by the part-of relation, but also by the temporal precedence and causal dependence.

Compare *plow a field* and *build a house*. Let e and e′ both be members of the incremental chain on the plowing become subevent, and e < e′. Then neither e is causally and temporally dependent on remainder of e in e′ nor vice versa: parts of a field can be plowed independently from each other in any temporal order. Things are different for *build a house*: before the roof is built, walls must be built, and walls cannot be built without a foundation. Therefore, given examples like (70), the descriptive generalization about English seems to be as follows: non-culminating readings are available for accomplishments whose become component is partially ordered by the part-of relaion but not by any other relation (specifically, by the temporal precedence and/or causal dependence).

These observations about the structure of the become subevent in English reveal a certain parallelism with what we have seen about the activity component of accomplishments in Russian. Mehlig (2003) and Rothstein (2004, p.c.) both mention homogeneity as a relevant property for identifying a class of predicates that allow for non-culmination. We believe that in both cases, "homogeneity" can be conceived of as the lack of inherent partial orderedness by the temporal precedence and causal dependence. Descriptively, then, Russian and Enlgish differ in that the mechanism generating non-culminating interpretations is sensitive to the inherent orderedness of the *activity subevent* in Russian but to that of the *become*

subevent in English. This is shown in (72), where arrows represent the lexical distribution of non-culminating predicates in Russian and English:

(72)



The range of interpretations of imperfective clauses in Russian and English is different, too. In Russian, imperfective clauses always allow for expected readings – partial success for any INCR accomplishments, as in (73a), and an attempt that has not yield any change for any MMFP accomplishemtns, as in (73b):

(73) a. *Vasja zapoln-ja-l anket-u pjat' minut, no*
v. fill.in-IPFV-PST.M form-ACC five minute.GEN.PL but
brosi-l eto delo.
give.up-PST.M this stuff
'Vasja was filling in the form for five minutes, but gave up.'

b. *Vasja otkr-yva-l dver' pjat' minut, no*
v. open-IPFV-PST.M door.ACC five minute.GEN.PL but
brosi-l eto delo.
give.up-PST.M this stuff
'Vasja was opening the door for five minutes, but gave up.'

As Rothstein (p.c.) indicates, unlike what happens in Russian in (73b), English progressive clauses do not allow for the FA-reading with MMFP accomplishment predicates:

(74) #I was opening the door for ten minutes (but gave up).

Progressive clauses derived from INCR accomplishments, on the other hand, do have the PS reading whereby the theme undergoes a certain amount of change, no matter whether the become subevent is inherently ordered:

(75) a. John was plowing a field for two hours.
b. John was building a house for two months.

We agree completely with Rothstein that a full-fledged theory of accomplishment event structure has to provide a principled explanation to the observed variation. A number of different options seem to be open at this juncture. Let us take a closer look at what kind of variation we can expect given the overall architecture of the

analysis we have assumed. In Section 2.4, we have suggested a hierarchy of functional heads involving (Viewpoint) Aspect and Continuation Modality dominating *v*P:

(76) [… [$_{\text{AspP}}$ IMPERFECTIVE/PERFECTIVE [$_{\text{CmP}}$ CONTINUATION MODALITY [$_{v\text{P}}$ … *v* … […]]]]]

Given this architecture, languages can vary along at least three dimensions: properties of aspectual operators located at AspP, properties of the continuation modality head, properties of the event descriptions denoted by *v*P. The latter includes lexical variation at the V^0 level as well variation in characteristics of functional structure dominated by *v*, if any. Properties of grammatical morphemes that originate as the same functional heads in different languages can in turn differ in two crucial respects: on the one hand, their semantics can be similar but not completely identical; on the other, they can impose different semantic restrictions on their complements.

The difference between languages like English and Russian discussed above can possibly be an outcome of the interaction of a number of factors just listed. The analysis developed so far, however, severely restricts the range of possible sources of variation. Firstly, as a reasonable null hypothesis we have assumed that event descriptions denoted by *v*Ps with similar lexical content are semantically alike in all languages under discussion. For instance, *v*Ps like 'John plow the field' denote event predicates $\lambda e \exists e_1 \exists e_2$ [$e = {}^{S}(e_1 \cup e_2) \wedge \text{Activity}_{\langle \text{plow} \rangle}(e_1) \wedge \text{agent}(e_1)=\text{John} \wedge \text{theme}(e_1)=\text{field} \wedge \text{Become}_{\langle \text{plowed} \rangle}(e_2) \wedge \text{arg}(e_2)=\text{theme}(e_1) \wedge \text{INCR}(e_2)(e_1)(C(e_2))$]. Secondly, we have proposed that the same continuation modality operator is always involved in the derivation of any non-culminating interpretations (see the example derivation in Section 4.4.1). Thirdly, we have suggested that non-culminating perfective clauses are always created by merging CmP with the perfective operator in (52). Given these assumptions, our analysis predicts just two possible sources of variation: semantic restrictions that two functional heads – the CM operator and aspectual operators – impose on their complements.

We believe that data from languages like English and Russian are at least compatible with this prediction.

In languages like Russian, the morphological makeup of non-culminating perfective accomplishments mirrors the hierarchy of functional heads in (76) directly: both have overt phonological exponents (see, e.g., (20) repeated as (77a)). Imperfective clauses, then, can be analyzed as involving zero imperfective morpheme, as in (77b).

(77) a. [… [$_{\text{AspP}}$ *po-* [$_{\text{CmP}}$ *-va-* [$_{v\text{P}}$ ... *Vasja otkry- dver'* … 'V. open the door']]]]
b. [… [$_{\text{AspP}}$ $\varnothing_{\text{IPFV}}$ [$_{\text{CmP}}$ *-va-* [$_{v\text{P}}$ ... *Vasja otkry- dver'* ... 'V. open the door']]]]

As we saw in Section 5.1, in Russian availability of non-culminating interpretations in perfective clauses is restricted by the perfective aspectual operator: it does not apply to event descriptions that refer to inherently ordered activities. No restrictions is attested in imperfective clauses, which always allow for expected non-culminating interpretations, as examples in (73) demonstrate. This suggests that the CM operator in Russian does not impose any restrictions on the semantic content of its complement *v*P: otherwise some of construals available at the *v*P level would have never surfaced due to the "secondary imperfective" morpheme (assuming, as before, that this morpheme is an exponent of the CM operator). For the same reason, it cannot be the case that zero imperfective operator filters out some part of the denotation of its CmP complement. Russian is thus a language where non-culminating readings are restricted only at the AspP level and only by the perfective operator.

Let us now turn to English material. Unlike Russian, English, as well as Balkar, Mari, and Bagwalal, do not possess separate pieces of morphology for Continuation Modality and Aspect, hence syntactically, English can be thought of as a language involving bundling of these two adjacent heads a la Pylkkänen (2002):

(78) [… [$_{\text{Asp/CmP}}$ IMPERFECTIVE/PERFECTIVE + CONTINUATION MODALITY [$_{v\text{P}}$ … *v* … […]]]]]

As Pylkkänen indicates, despite mophosyntactic bundling, semantically there still are two distinct operators (perfective/imperfective and continuation modality, in the case at hand), each of which can potentially impose semantic restrictions on its complement. Here are a few considerations about what these restrictions could look like in English.

As we have just seen, neither perfective (simple past) non-culminating clauses nor imperfective clauses in English produce the FA reading. Since, by hypothesis, the CM operator is what these clauses have in common, this fact can indicate that the FA reading is blocked as soon as the CM head merges with *v*P. If "no-activity-subevent-that-does-not-bring-about-a-change" is a presupposition associated with the CM operator in English, its application effectively eliminates semantic potential for the FA reading in both non-culminating perfective and imperfective clauses. Still, CmP has a full potential for the PS readings where the activity does produce change in the theme.

As we saw earlier in (70a–d), simple past non-culminating clauses are further restricted: they license non-culminating PS readings for predicates like 'plow a fileld', but not for 'build a house' where the change of state is inherently ordered. This suggests that the perfective operator is associated with its own presupposition: the become subevent in the denotation of its complement is not inherently ordered. In contrast, no additional restrictions on PS readings are introduced by the imperfective operator, as is clear from examples like (75a–b).

The system just outlined can therefore be viewed as involving two filters, narrowing down the denotation of event predicates created in the course of the derivation – one at the CM level, another at the Asp level. While possessing the same denotations, CM and Asp and operators in English and Russian differ as to the selectional restrictions they are associates with. These restrictions are summarized Table 1:

Table 1. Semantic restrictions associated with functional heads in English and Russian

	CM operator	**PFV operator**	**IPFV operator**
Russian	no restrictions	The activity subevent in the denotation of the complement is not inherently ordered	no restrictions
English	The activity subevent in the denotation of the complement brings about a change	The become subevent in the denotation of the complement is not inherently ordered	no restrictions

Two concluding remarks are in order. First, within the proposed system cross-linguistic variation in the domain is attributed to selectional restrictions associates with operators located at functional heads dominating *v*P. Crucially, positing such restrictions does not seem to create a source of ad hoc stipulations: in the typological literature (e.g., in seminal work by Dahl (1985, 2000) and Bybee et al. (1994)) one can find extensive evidence that such restrictions do exist, hence should be admitted by the theory anyway. For instance, in a variety of languages, the resultative only applies to predicates that contain a result state with positively specified descriptive properties in their semantic representations, but not to activity and state predicates. Besides, progressive verb forms are famous for not being able to combine with state descriptions, especially with individual level predicates. Furthermore, these restrictions vary across languages: even within (Indo-)European family lexical distribution of progressive forms is similar but not exactly the same. These observations seem to justify, although only indirectly, our suggestion that constraints on non-culminating interpretations can originate from a similar source.

Secondly, observations we made in this section are based on the material from just two languages, English and Russian, which is critically insufficient for making reliable cross-linguistic generalizations. The problem is that typological data on non-culmination is by far incomplete, since a systematic cross-linguistic study of eventuality type have never been undertaken. Before developing a theory of non-culmination with full empirical coverage, we have to elaborate a representative list of accomplishment predicates and examine each predicate in the list across a representative sample of languages. This will give us empirical generalizations about

variation, making clear what exactly are constraints on this variation and whether working hypotheses put forward in present study are tenable. We hope this work will be done soon.

6. Summary

We distinguished between three subclasses of accomplishment verbs that differ as to whether they allow for the *failed attempt reading, partial success readings or both*. Accomplishments that possess these interpretations are regarded as a special case of *non-culminating accomplishments*. In accordance with claims independently made in the literature, we suggested that the essential part of the semantic structure of non-culminating predicates is *the continuation modality operator*. However, the difference between failed attempt, partial success and non-restricted accomplishment predicates cannot be created by this operator and must be found in lexical representations of corresponding verbs. Having reviewed two main approaches to accomplishment event structure — non-decompositional and causative theories of accomplishments — we found that both face complications that cannot be overcome easily. Having opted for Rothstein's (2004) theory of accomplishments, we extended this theory by suggesting that one of the possible relations between ACTIVITY and BECOME subevents is the *mapping to a minimal final part* (MMFP). We argued that for the failed attempt interpretation to obtain, MMFP must be specified in the accomplishment event structure. The partial success interpretation is due to the incremental relation between subevents originally proposed by Rothstein (2004). Finally, we suggested that non-restricted accomplishments compatible with both failed attempt and partial success interpretations are lexically underspecified with respect to the relation between subevents.

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The grammaticalised use of the Burmese verbs la 'come' and θwà 'go'*

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This paper describes the grammatical uses of the Burmese motion verbs *la* 'come' and *θwà* 'go'.

The verbal markers *-la* 'COME' and *-θwà* 'GO' fulfil different functions according to (1) the semantics of the verb they modify, (2) the way in which events are represented in the clause/sentence, and (3) the context of occurrence in which *-la* 'COME', and *-θwà* 'GO' appear. With motion verbs, they express directionality of motion of the participants in the speech act. With non-motion verbs, they function as inchoative markers, i.e. as markers of a change in the entity's state.

In addition, *-θwà* 'GO' is used in clauses/sentences to mark the decreased salience of the Agent and the correspondent increased salience of the Undergoer. This function of *-θwà* 'GO' will be compared with the function of *-lai?* 'FOLLOW', derived from the motion verb *lai?* 'follow', which is used to mark a high degree of transitivity of the clause.

1. Introduction

In this paper, I will investigate the relation that holds between the various functions of the Burmese verbal markers *-la* 'COME' and *-θwà* 'GO' and their lexical sources *la* 'come' and *θwà* 'go'. I will argue that it is metaphorical in nature. In addition to being grammaticalised as markers of direction of motion, motion verbs have also been proved to be good sources for markers of tense and aspect cross-linguistically (Bybee 1985; Bybee et al. 1994; Lichtenberk 1991; Sweetser 1988;

*I am grateful to my language consultant and friend, Daw May Thet Tun, for helping me understand the intricacies of the Burmese language and for supporting me in this endeavour. I would like to thank Mathias Jenny and an anonymous reviewer for their invaluable comments on an early draft of this paper. Last, but not least, I would like to thank Mengistu Amberber and my colleagues in the Linguistics Program, University of New South Wales (Australia), for their friendship and assistance during the writing process.

Talmy 2000; Traugott 1975; Traugott 1978, etc.). Their cognitive structure, called *image-schematic structure* (Talmy 1985, 2000), is metaphorically projected into the structure of the target domain, thus producing a shift in the meaning of forms from indicating motion in space to indicating motion in time.

2. The full lexical verbs *la* 'come' and *θwà* 'go'

The verb *la* 'come' expresses motion towards the deictic centre (DC), i.e. the location at which the speaker, the hearer or both participants in the speech act (SAPS) were, are or will be located, or think of themselves as being located at some specific point in time (this last option referred to by Goddard (1998: 207) as *deictic projection,* a term coined by Lyons (1977: 579)). On the other hand, *θwà* 'go' expresses motion away from the DC or motion unconnected with the DC.

An important role in the use of these verbs expressing directionality of motion in Burmese, English and other languages is played by *viewpoint*, defined as the '… degree of identification which the speaker feels with the goal of the motion' (DeLancey 1980: 16). Speakers will decide to use *come* or *go* to describe a motion event depending on whether or not they choose to adopt the DC as their viewpoint.

In the case of *la* 'come', the goal of motion (i.e. the DC) may be the location occupied by either the speaker or the hearer or both, and the source of the motion may be unknown or left unspecified as in:

(1) *di né mə = la = né*
this day NEG$_1$ = come = NEG.IMP
'Don't come today!' (speaker = DC) (Myint 1994: 126)

(2) *tɕəmá la = kʰɛ́ = mɛ*
I come = BACK.THERE = IRR
'I will come' (hearer = DC) (Myint 1994: 126)

(3) *me di = ko la = tɛ*
May here = TO come = REAL
'May came here' (speaker + hearer = DC)

The source of motion can be expressed overtly as in:

(4) *me Darwin = m̥á di = ko la = tɛ*
May Darwin = FROM here = TO come = REAL
'May came here from Darwin

In addition, *la* 'come' is also used to indicate motion of a non-participant in the speech act towards the DC:

(5) *ŋá = s^hi = ko θu mə = la = p^hù*
my = place = TO she NEG$_1$ = come = NEG$_2$
'She didn't come to my place' (Myint 1994: 126)

θwà 'go' is used to express motion away from the DC, i.e. from either speaker, hearer or both. The destination may be left unspecified as in:

(6) *John di = ka t^hwɛʔk^hwa = pì̀ θwà = tɛ*
John here = FROM leave = PFV go = REAL
'John left from here and went (off)'

or it can be expressed overtly as in:

(7) *θú = s^hi = ko θwà*
his = place = TO go
'Go to his place!' (Myint 1994: 126)

(8) *θú = s^hi = ko θwà = mɛ*
his = place = TO go = IRR
'I will go to his place' (Myint 1994: 126)

In addition, *θwà* 'go' is used when motion occurs between two locations other than the DC, where the speaker/narrator is located:

(9) *ŋɛʔ = kəlè θiʔpĩ = m̥á tɕauʔ = pɔ = θó θwà = te*
bird = small tree = FROM rock = ON = TO go = REAL
'The bird went from the tree to the rock (I can see both the tree and the rock)'

3. The structure of Burmese independent clauses

Before discussing the function of the markers *-la* 'COME' and *-θwà* 'GO', though, it is important to provide readers with information on the structure of Burmese independent clauses, and, more specifically, on the structure of the verbal complex, in which these markers are found.

The following is the structure of Burmese independent clauses: (# = sentence boundary):

(10) #(PERIPHERY) NP^n [(Pre-V) = V = (Post-V)]$_{\text{VCOMPLEX}}$ # (with 0 ≤ n ≤ 3)

The only obligatory element in the clause is the *predicate*, which is typically represented by a verbal form (V), or by a combination of verbs which stand in a relation of serialisation. The predicate may be modified by markers which either precede it [*Pre-V operators* (Pre-V)] or follow it [*Post-V operators* (Post-V)]. The combination of the predicate and its markers is referred to as the *verbal complex*, which is

strictly clause-final. The presence of the predicate's core NPs is optional, in that they will not appear in the clause if they are contextually retrievable. If they do appear in the clause, they will precede the verbal complex. In addition, the clause may show the presence of a *periphery*, which usually contains optional elements, such as temporal and/or locative constructions or forms. The position of core NPs vis-à-vis the periphery is extremely flexible and it is ruled by pragmatic principles, whereas the verbal complex is strictly anchored clause-finally.

The following is an example of a Burmese independent clause:[1]

(11) *mjĩða-mjó = m̥a* *sʰèjõu-sʰəjawũdʑì = ká* *tɕʰe = ko* *kúθá = tɛ*
Myintha-village = AT hospital-head.doctor = SUBJ leg = OBJ treat = REAL
'The head doctor of the hospital at Myintha treated [his] leg' (Yin 1981: 24)

4. The markers *-la* 'COME' and *-θwà* 'GO'

The full lexical verbs *la* 'come' and *θwà* 'go' are often used as bound markers, conveying various notions according to the semantics of the verbal base to which they are attached and their role in discourse.

An important feature in the description of *-la* 'COME' and *-θwà* 'GO' is their use as directional markers with motion verbs in *dialogues* and in *narratives*.

In dialogues, they specify the orientation of motion of the actual participants in the speech act with respect to one another as opposed to any other non-participants and any other location different from that of the SAPS (in our terminology, the non-DC).

In narratives, it is the narrator who establishes the connections between the participants in the narrative event and their location by using these two forms to 'manipulate text building', an expression that Robert J. Bickner (1989: 16 ff) uses to describe their function in Thai narrative. In their directional use, *-la* 'COME' and *-θwà* 'GO' specify the direction of motion of the core arguments, i.e. the participants in the motion event.

In addition to their use as markers of direction, *-la* 'COME' and *-θwà* 'GO' are also used with verbs which express change of state to mark the attainment of the goal of the change (the new state) either through progression in time (with *-la* 'COME')

1. Burmese makes extensive use of segmental and tonal sandhi (collectively known as *close juncture*) to mark grammatical processes. The symbol = indicates grammatical boundness. Lack of grammatical boundness is shown by the symbol -. The markers involved in sandhi alternations are shown in their citation form, not in their modified phonetic realisation.

or instantaneously (with *-θwà* 'GO'). They therefore show ingressive/inchoative function.

4.1 *-la* 'COME' and *-θwà* 'GO' with motion verbs

When the markers *-la* 'COME' and *-θwà* 'GO' follow a motion verb, they convey either of the following senses:

a. in dialogues, *-la* 'COME' and *-θwà* 'GO' orient motion towards and away from the location of the SAPs respectively;
b. in narratives, *-la* 'COME' orients motion towards the actual, habitual or intended location of the character(s) involved in a particular context and considered to be the narrative pivot(s). On the other hand, *-θwà* 'GO' orients motion away from the character(s) involved in a particular section of narrative discourse and from its/their location.

4.1.1 -la 'COME' *and* -θwà 'GO' *with motion verbs in dialogues*

In Burmese, motion verbs are often unmarked for orientation: wĩ 'enter', tʰwɛʔ 'exit', tɛʔ 'ascend', sʰḭ 'descend', etc. Because of the salience given to the SAPs and their respective location, in most cases the language requires that markers of orientation be present.

In the following instances, the function of *-la* 'COME' is to indicate that the motion of the addressee and/or other entities is oriented towards the speaker:

(12) *mḭ = tó θaʔtí = ʃí = jĩ ʃé tò = la = tɕá = sà̰*
you = PL courage = be = IF front advance = COME = PL = URGENT
'If you have courage, come forward all of you' (Yin 1981: 68)

(13) *mḭjətʰà sʰaiʔ = mə = la = θè = pʰù = là*
train arrive = NEG$_1$ = COME = STILL = NEG$_2$ = INT
'Hasn't the train arrived (here) yet?' (Okell 1969: 328)

With motion verbs, the function of *-θwà* 'GO' in direct speech is to orient the motion of the SAPs away from the DC. In the following example, Maung Kyo and his father are the SAPs and their trajectory will lead them away from their shared location:

(14) *tɛ̀ = sʰi = ko tʰà̰-kʰɔ = θwà = pa = hú*
hut = place = TO carry.on.shoulder-take = GO = POL = QUOT
ŋo = jwé pjɔ̀ = le = í́
cry = AND say = EU = REAL
'[He] said "Please, carry [me] to the farm house' (Yin 1981: 23)

The use of *-la* 'COME' and *-θwà* 'GO' is neatly exemplified in the following minimal pair:

(15) a. *mì̃ tɕà̃u = ko kà mà̃u = la*
you school = TO car drive = COME
'Drive to school [where I am]' [Myint 1994: 128]

b. *mì̃ tɕà̃u = ko kà mà̃u = θwà*
you school = TO car drive = GO
'Drive to school [where I will not be]' (Myint 1994: 129)

4.1.2 -la '*COME' and* -θwà '*GO' with motion verbs in third-person narratives*
In narratives, *-la* 'COME' orients motion towards the actual, habitual or intended location of the character(s) involved in a particular context and considered to be the narrative pivot(s). On the other hand, *-θwà* 'GO' orients motion away from the character(s) involved in a particular section of narrative discourse and from their common location.

In the following passage, the narrator describes a scene where the main character (a boy) climbs on a tree and an owl flies out of a hole in the trunk towards him:

(16) *zì̀gwɛʔ = ŋɛʔ = tɕì̀ pjã-tʰwɛʔ = la = tɛ*
owl = CLASS = big fly-exit = COME = REAL
'[The boy climbed on the tree where the big branch was and when he inclined his head and looked at it], a big owl flew out [from a hole in the branch]'

The narrator has taken the main character and his location as her viewpoint and she describes the trajectory of motion of the owl as being oriented towards the main character by utilising *-la* 'COME'. The motion event is represented holistically by the combination of manner of motion (*pjã* 'fly'), motion out of a bounded region/enclosure (*tʰwɛʔ* 'exit') (Haviland 1991: 24) and deictically anchored motion (*-la* 'COME').

In the following example:

(17) *dəjɛ-gà̃u = pɔ tʐo-tɕà lɛ́̃i-tɕá = θwà = le = tɔ́ = tɛ*
deer-head = ON antlers-between roll-fall = GO = EU = FINAL = REAL
'[The deer too was scared and when it tossed its antlers, the boy's leg was freed and] (the boy) rolled and fell between the deer's antlers'

the narrative focus is still on the main character, i.e. the boy, and the motion event that involves him is seen as projecting him away from his location, the DC.

In the following sentence:

(18) *mãutɕʰo mə = tʰá = nãi = ʃí = sĩ*
Maung.Kyo NEG_1 = get.up = CAN= BE= WHILE
θú = pʰəkʰr̃ĩ = ká pjè = la = pì̀ sʰwɛ̀ = jwé tʰu = le = í́
his = father = SUBJ run = COME = PFV pull = AND help.a.person.up = EU = REAL
'He could not get up and his father ran [to him] and pulled him up' (Yin 1981: 23)

Maung Kyo is again the centre of attention of the narrative and as such the orientation of motion of the other character is marked by *-la* 'COME'. On the other hand, in the following paragraph, Maung Kyo is directly referring to the goal of motion that both he and his father will share (their house), situated away from their actual location, and as a consequence the motion serial verb construction *t^{h}à̰-k^{h}ɔ* 'carry (on shoulders) - take/bring' is marked by *-θwà* 'GO':

(19) *mãutɕ^{h}o = ká* *na = laiʔ = ta* *ə̀p^{h}e = jɛ*
Maung.Kyo = SUBJ hurt = FOLLOW = REAL father = PLEAD
tɕənɔ *là̰-mə = ʃauʔ = nãi = tɔ́ = p^{h}ù*
I road-NEG$_1$ = walk = CAN = FINAL = NEG$_2$
tɛ̀-s^{h}i = ko *t^{h}à̰-k^{h}ɔ = θwà = pa = hú* *ŋo = jwé* *pjɔ̀ = le = í́*
hut-place = TO carry-take = GO = POL = QUOT cry = AND say = EU = REAL
'Maung Kyo said (while) crying 'It hurts a lot, father. I can't walk.
Please take me home' (Yin 1981: 23)

A further example of the expression of viewpoint is the use of *-la* 'COME' and *-θwà* 'GO' with *jauʔ* 'arrive', a verb "… of inherently directed motion" as Levin defines it (1993: 263). The semantics of this verb can be paraphrased as 'an entity *x* moves so that it attains, and is located at, its goal *y*'. Its meaning combines the indication of unspecified motional activity with the indication of its destination, expressed overtly by means of an adpositional phrase indicating the goal of motion or left unspecified because redundant or irrelevant to context. In Burmese, the goal is shown by a postpositional phrase headed by the allative *-ko/θó* 'TO' which emphasises the preferred motional component of the combination.

The semantics of *jauʔ* 'arrive' differs from that of English *arrive* and their counterparts in other languages (e.g. Italian and French). The activity component present in the semantics of *jauʔ* 'arrive' is absent in the semantics of English *arrive*. The latter simply tells us that 'an entity *x* has changed its location over time and it is located at *y*', and, therefore, it focuses on its locative/stative component. This observation is complemented by the fact that the goal of motion is expressed by prepositional phrases headed by the locative *at* or *in* (Italian *a/in*, French *à/en*, etc.).

In English and other languages, deictic specification of motion may be rendered lexically or may be left unmarked according to context, as in:

(20) He arrived here/there five minutes ago (deictically specified)
He arrived five minutes ago (deictically unspecified)

In Burmese, deictic specification of motion is obligatory and is expressed morphologically by the use of our markers *-la* 'COME' and *-θwà* 'GO', according to

the saliency given to the participants in the speech act by the narrator. For example:

(21) a. *dəgɛ = pĩ* *θə̀udʒə̀ðu = tó* *ne = θí*
finally = INDEED rebel = PL stay = REL_{REAL}
səkʰə̀-ənì = θó *jauʔ = θwà = tɕá = le = í*
camp-vicinity = TO arrive = GO = PL = EU = REAL
'[Five days later, after they had made preparations for the attack and spread out the forces toward the place which Maung Kyo had mentioned], at last (they) arrived near the rebels' camp'

b. *θu = tó* *jauʔ = la = θi = ko* *θi = tɕá = θɔ̀* *əkʰa*
he = PL arrive = COME = REAL = OBJ know = PL = REL_{REAL} time
'When the rebels knew that (the government forces) had arrived, [they put the students in front of them as a sort of earth breastwork and defended themselves]' (Yin 1981: 50)

In (21a) and (21b), the marking of the verb *jauʔ* 'arrive' for orientation varies according to the viewpoint the narrator takes on the events he describes and, as a consequence, on the participants in the narrative act and the locus at which the events involving the SAPs take place. In (21a), the narrator describes the event from the viewpoint of the military whose trajectory of motion has led them to their goal away from their deictic centre, i.e. the rebels' camp, where the students are held captive. As a consequence, the non-deictically oriented verb *jauʔ* 'arrive' has been marked by *-θwà* 'GO'. In (21b), on the other hand, the trajectory and the goal of motion of the military are seen by the narrator from the viewpoint of the rebels and their location, i.e. from the end-point of motion. In order to convey this change of perspective, the narrator has marked *jauʔ* 'arrive' by *-la* 'COME'.

4.2 *-la* 'COME' and *-θwà* 'GO' with non-motion verbs

Soe Myint (1994) states that "When following verbs that refer to concrete actions, *la* and *swà* [i.e. *-la* 'COME' and *-θwà* 'GO'] retain their full lexical meaning" (Myint 1994: 127). The following sentences are an example of this use:

(22) *θu* *tʰəmə̀ì* *sà-la = tɛ*
he rice eat-come = REAL
'He ate rice (and came)' (Myint 1994: 127)

(23) *meri* *tʰəmə̀ì* *tɕʰɛʔ-θwà = tɛ*
Mary rice cook-go = REAL
'Mary cooked rice (and left)' (Myint 1994: 127)

In fact, these are examples of serialised verb constructions, where the two verbs in the verb complex retain their full lexical meaning and are sub-components of the

event seen in its totality (as a consequence, the glosses 'come' and 'go' are in lower case to indicate the lexical, rather than grammatical, character of these forms).

While this analysis is true of some constructions, by no means does it exhaust all possible functional uses of these predicates. For instance:

(24) *nauʔ = tʰaʔ* *tɕãu = ŋɛlè-tə = kãu* *mwè = la = pjã = le = ́i*
further = again cat = small-1 = CLASS be.born = COME = ITERATIVE = EU = REAL
'Another kitten was born' (Yin 1981: 20)

Here, no physical displacement or motion towards a DC is implied in the use of *-la* 'COME' (the kitten was born and came here) nor is there any idea of motion away from the DC in the following:

(25) *mãutɕʰo* *tɕʰedauʔ* *tɕò = θwà = ta*
Maung.Kyo leg break = GO = REAL
'Maung Kyo broke [his] leg' (*the leg broke and [he or the leg] went away)

As we shall see, the function of *-la* 'COME' and *-θwà* 'GO' used with non-motion verbs is far more complex than their function in (22) and (23). In most cases, both forms mark predicates denoting a change in the state of a particular entity, the Undergoer. If the change of state is seen as unfolding and evolving towards a natural end point through progression in time, the predicate will be marked by *-la* 'COME'. For instance:

(26) *ɲãu = kə̀̃i = ko* *kãi = tʰà = θɔ̀* *lɛʔ = m̥a*
tree = branch = OBJ hold = PUT = REL_{REAL} hand = TOP
tõu = la = pì = ɬjĩ
tremble = COME = PFV = WHEN
'[Because he was scared, his] hands holding the branches started trembling, and ….' (Yin 1981: 110)

On the other hand, if the change of state occurs or is conceived of as having occurred instantaneously, i.e. if the temporal span between the end of the previous state and the onset of the new one is considered to be negligible or irrelevant, the predicate will be marked by *-θwà* 'GO'. For example:

(27) *mì̀lãu = tɛ́* *ətʰɛ̀ = m̥a* *əkõu* *pa = θwà = tɛ*
burn = REL_{REAL} inside = AT everything lose = GO = REAL
'Everything was lost in the fire' (Okell & Allott 2001: 248)

4.2.1 -la 'COME' *with non-motion verbs*

The marker *-la* 'COME' occurs with non-motion (often stative) verbs to mark an entity's change of state whose goal (the new state) is attained through progression

in time. The Undergoer experiences the change of state and it is precisely from his viewpoint that the change is witnessed. For instance:

(28) *mápútɕwɛ = θi* *tʰo* *kʰəjú = ŋɛ = ko* *tɕí = ji̋* *àtɕá = la = θi*
Ma Pu Kywe = SUBJ this snail = small = OBJ see = WHEN admire = COME = REAL
'When Ma Pu Kywe saw the little snail, [her] admiration grew' (Okell 1994: 97)

(29) *tʰo* *əkʰa* *jõu = ká* *sʰɪ̃dzi̋ = ko* *θənà = la = jwé* *tɕà*
that time rabbit = SUBJ elephant = OBJ pity(V) = COME = AND tiger
la = mé *né = m̥a* *tʰəmənè-tə = ò = θa* *tɕò = tʰà = n̥ĩ́ = pa*
come = REL_{IRR} day = AT tamanè-1 = pot = ONLY cook = PUT = IMP = POL
'Then, the rabbit took pity on the elephant and [said] 'On the day the tiger will come, cook a pot of tamanè' (Yin 1981: 114)

The verbs *àtɕá* 'admire' and *θənà* 'pity' are classified as 'verbs of psychological state' (or psych-verbs)' (Levin 1993: 188ff.). The psychological state of the experiencer ('Ma Pu Kywe' and 'rabbit'), identified by the subject, undergoes a change triggered by the stimulus ('snail' and 'elephant'), represented by the object. The function of *-la* 'COME' as an inchoative/perfective marker represents a metaphorical extension from its function as a directional marker with motion verbs, both of which ultimately derive from the semantics of its source, the full verb *la* 'come'. The latter describes the progression of an entity towards a location that is known, the DC, which is occupied by the SAPs, thus identifying a trajectory that is bounded, with the SAPs considered as the target of motion. As Lichtenberk points out, "… the movement is TO the deictic centre, not just TOWARD it" (Lichtenberk 1991: 488).

If we adopt the metaphor STATES ARE LOCATIONS and its sub-type REACHING, ENTERING A STATE IS ARRIVING AT A LOCATION (Lichtenberk 1991: 487), we can equate the trajectory of motion for *come* as schematised below:

(30) $LOCATION_1$ > $LOCATION_2$ = DC = SAPS
la 'come'

with the trajectory of change from a previous state to a new state:

(31) $STATE_1$ > $STATE_2$
-la 'COME'

The new state is the state identified by the full lexical verbs *àtɕá* 'admire' and *θənà* 'pity', while the experiencers of these psychological states are located at the end of the trajectory of change in the same way as the SAPs are the goals of a trajectory of motion marked by *-la* 'COME'. In addition, in the same way as reaching a place occurs over a period of time, the changes of state marked by *-la* 'COME' have as their goal the end-point of processes which take place gradually. The following are further examples of the use of this marker:

(32) *nauʔsʰõ̀u = n̥aiʔ ãu = já = mɛ = m̥a*
last = AT be.victorious = MUST = IRR = DEV
θetɕʰa = θi = hú mjĩ = la = θi
be.sure = REAL = QUOT see = COME = REAL
'[She] realised that it is sure that [one] will be victorious at last…' (Okell 1994: 97)

The English translation for *mjĩ-la* 'think-COME' used in this example is *realise*, whose paraphrase 'come to a conclusion by the process of thinking' highlights the process leading to a natural end-point and to the attainment of its goal. The same may be said of the following:

(33) *ɲá kò = naji tʰò = θɔ̀ əkʰa θu = θi*
evening 9 = hour strike = REL_{REAL} time she = SUBJ
ətɔətã sʰo = nãi = la = θəpʰjĩ́
quite.a.bit recite = CAN = COME = BECAUSE
wũ̀mjauʔwũ̀θa = pʰjiʔ = jɛʔ eiʔja = θó wĩ = θi
be.happy = be = AND bed = TO enter = REAL
'[She had been trying to memorise the poem] When nine o'clock struck, since she could recite quite a bit [of it], [she] was happy and went to bed' (Okell 1994: 97)

In this instance, *-la* 'COME' does not immediately follow the main verb *sʰo* 'say, recite', as in most examples in my sample, but it is preceded by the marker *-nãi* 'CAN', which directly modifies the main verb:

(34) [[*sho- nãi*]-*la*]
[[recite = CAN] = COME]

-la 'COME' does not have scope over *sʰo* 'say, recite' but it has scope over the combination [*sʰo = nãi*] 'recite = CAN'. This means that it is the ability to perform the activity ('can recite a poem') that is seen as having developed over time in order to produce the expected result ('having come to the ability of reciting a poem').

The following is an interesting example of how important lexical analysis is for the study of the use and function of aspectual markers in Burmese. The main character Maung Kyo has to deliver a letter to the members of the village committee (the local council) and he asks an old man information on how to get there:

(35) [The old man said "Yes, there is an office. Come along, my grandson" and took him to the office]
mãutɕʰo = θi sa = ko eiʔ = tʰɛ̀ = m̥a ʍɛʔ = ju = la = pǐ
Maung.Kyo = SUBJ letter = OBJ pocket = INSIDE = AT hide = TAKE = COME = PFV
əpʰòo pjá = ja tɕèjwa-kɔməti-jõ̀u = θó jauʔ = θwà = le = i
old.man show = WHEN village-committee-office = TO arrive = GO = EU = REAL
'Maung Kyo hid the letter in [his] pocket and when the old man showed [him], [he] arrived at the office of the village committee'

At first glance, it is difficult to justify the combination of a verb such as *ʍɛʔ* 'hide' with the markers *ju = la* 'TAKE = COME' that typically mark motion verbs. However, the meaning of *hide* does contain a component of motion or transference: someone moves an entity and places it at a particular location in order for the entity not to be found or seen. In this case, the Actor (Maung Kyo) and the location at which the Undergoer (the letter) will be placed (his pocket) occupy the same physical space, the DC. This particular notion is further specified by the grammaticalised use of the full verb *ju* 'take' (as the marker *–ju* 'TAKE'), which from indicating 'inner-directed' motion (Matisoff 1991: 437–438) or "… continuous causation of accompanied motion in a deictically-specified direction" (Gropen et al. 1989, quoted by Levin 1993: 135) has been metaphorically extended to indicate activities performed for one's own benefit, where the goal of motion is not the physical ego but the conceptual/subjective ego. In our example, although transference and objective motion do exist, it is more likely for *–ju* 'TAKE' to mark the activity as performed for the Actor's benefit, in that he has hidden the letter in *his* pocket for his *own* safety. Moreover, even though *–ju* 'TAKE' marks in this case an abstract notion rather than an objective one, because of its inherent motional quality, it still needs to be specified as to the orientation of motion, marked by *-la* 'COME'.

The function of *-la* 'COME' as an ingressive/inchoative marker is clearly shown in the following examples:

(36) *nauʔsʰõ̀u = twĩ θu = θi seiʔpjɛʔ = la = θi*
last = AT she = SUBJ be.discouraged = COME = REAL
'At last, she became discouraged' (Okell 1994: 97)

(37) *mjákʰĩ = í eme = ətwɛʔ = lɛ̀ seiʔpu = la = le = í́*
Mya.Khin = POSS mother = FOR = ALSO be.worried = COME = EU = REAL
'[She] became worried about Mya Khin's mother' (Yin 1981: 8)

(38) *pʰòte = ko sʰõ̀umá = tɕá = sʰojĩ lẽima = la = nãi = pa = tɛ*
Po.Te = OBJ admonish = PL = IRR = IF be.wise = come = CAN = POL = REAL
'If [you] admonish Po Te, [he] will be able to become wise' (Yin 1981: 42)

(39) *mòl̀ĩ = kʰa ni = la = θɔ̀ əkʰa*
dawn = time be.near = COME = REL_{REAL} time
'When it was almost dawn……..' (Yin 1981: 64)

(40) *je = ha nauʔ = pì kʰà = la = pa = tɛ*
water = SUBJ be.muddy = PFV be.scarce = COME = POL = REAL
'The water became muddy and scarce' (Yin 1981: 70)

(41) *bádʑì-tʰù = í mjɛʔn̥a = θi wì̃-tʰẽi = la = í́*
Uncle-Thun = POSS face = SUBJ be.bright-be.shining = COME = REAL
'Uncle Thun's face brightened' (Yin 1981: 74)

(42) *tɕəɲɔ tɕì = la = jĩ* *ùù = lo* *lu-na = twe = ko*
I be.big = COME = WHEN uncle = LIKE person-be.ill = PL = OBJ
sʰèkú = nãi = tɛ́ *paɲa = mjò*
give.treatment = CAN = REL_{REAL} knowledge = PL
taʔ = tɕʰĩ = laiʔ = ta = hú *pjɔ̀ = le = í*
know = WANT = FOLLOW = REAL = QUOT say = EU = REAL
'When I grow up, [I want to learn to treat ill people like you, Uncle'

Finally, as was anticipated earlier, *-la* 'COME' is often used to mark changes of state which express (re-)entrance into a normal state of being, as Clark (1974) has shown to be happening in certain expressions in English. For example (Clark 1974: 320):

(43) The motor came alive again

(44) They came back to their senses

The following are a few instances of the same use in Burmese:

(45) *əmjòðə-sape* *léla = m̥ú = lɛ̀* *pwĩ́là̰ = la = pa = θi*
national-literature study(V) = DEV = ALSO flourish = COME = POL = REAL
'Also the study of the national literature flourished [cf. 'came to flourish after a period of cultural darkness']' (Okell 1994: 120)

(46) *tiʔ = né = m̥a* *mì = jɛ́* *seiʔkù* *əkãuətʰɛpɔ = la = lɛ́i = mɛ*
1 = day = AT you = POSS dream materialise = COME = MAYBE = IRR
'One day, your dream will come true'

(47) *əmjòðəmì* *míniʔ-ənèŋɛ-ətwì* *pjãlɛ*
woman minute-a.little-duration again
θədíjá = la = kʰɛ́ = tɛ
regain.consciousness = COME = BACK.THERE = REAL
'The woman came to in a few minutes'

(48) *θu = tó* *eiʔ-ja = m̥á* *nò = la = θɔ̀* *əkʰa*
he = PL sleep-place = FROM wake.up = COME = REL_{REAL} time
'When they woke up…[i.e. 'came back to a state of alertness']' [Yin 1981: 122]

(49) *nauʔ-tʰaʔ* *tɕãu-ŋɛlè-tə = kãu* *mwè = la = pjã = le = í*
further-again cat-small-1 = CLASS be.born = COME = ITERATIVE = EU = REAL
'Another kitten was born [cf. 'came into this world/to life']' (Yin 1981: 20)

Other languages use *come* to mark entrance of an entity into a normal state of being as in English and Burmese. For instance Thai shows instances of this use (Gandour 1978: 384):

(50) *kháw sùup 'heroin' fýyn maa*
he smoke recover come
'He recovered from his heroin trip' (Gandour 1978: 4b–384)

as opposed to:

(51) *kháw sùup 'heroin' khlɔ́əm paj*
he smoke doze go
'He tripped out on heroin' (Gandour 1978: 4a–384)

The use of *-la* 'COME' to mark the entrance in and attainment of a state seen as the most natural/positive finds its opposite, as we will see, in the use of *-θwà* 'GO' to mark the exit from states that are seen as the most natural/positive.

4.2.2 -θwà 'GO' *with non-motion verbs*

The marker *-θwà* 'GO' marks an entity's change of state perceived as occurring instantaneously, i.e. where the time span between the entity's exiting the old state and entering the new one is negligible or irrelevant to discourse. Again, in order to explain the use of *-θwà* 'GO' to mark changes of state, we must take into consideration the semantics of its lexical source, the main verb *θwà* 'go'. The latter shows a trajectory of motion originating from the DC that may be bounded or unbounded depending on the existence or non-existence of a goal of motion. What is crucial here is that what is known is the origin of motion, not its end-point. In fact, if we look at the concept of motion inherent in *θwà* 'go' and we transpose it to events that are not motional marked by its grammaticalised metaphorical extension *-θwà* 'GO', in particular to changes of state, we will see that the change of state is seen from the viewpoint of its onset, not from its end-point. This fact bears two important aspectual consequences.

Firstly, if a change of state is marked by *-θwà* 'GO', since it is only its onset that is focused on and not its end-point, it is not seen to occur over an interval (as it would if it were marked by *-la* 'COME') but as occurring punctually. In fact, native speakers often refer to the change as taking place 'suddenly'. Secondly, in the same way as *θwà* 'go' marks motion away from a known (and therefore 'safe') location (the DC), *-θwà* 'GO' marks the exit from a known (therefore 'normal') state, which the entity affected by the change may not be able to access again. If this is the case, the new state is then assumed not to change in the future, an explanation that is supported by the fact that many changes of state marked by *-θwà* 'GO' are often considered as irreversible.

This use of *-θwà* 'GO' differs from that of *-la* 'COME' seen above, whose function is to mark an entity's change of state seen as unfolding towards a natural end-point through progression in time. The difference between these two markers is shown in the following examples:

(52) *èɬá = ɪ́* *jĩ = tʰɛ̀ = twĩ*
Aye.Hla = POSS breast = INSIDE = AT
θɛ́i = kənɛ̀ *tõuɬou? = θwà = le = ɪ́*
tremble(V) = ABRUPT tremble = GO = EU = REAL
'There was a sudden stir in Aye Hla's breast' (Yin 1981: 14)

(53) *ɲãu-kə̀i = ko* *kãi = tʰà = θɔ̀* *lɛʔ = m̥a*
tree-branch = OBJ hold = PUT = REL$_{REAL}$ hand = TOP
tõu = la = pì = ɬjĩ
tremble = COME = PFV = WHEN
'(Kyaung Thu was so afraid that) when [his] hands holding the branches trembled, (the branches broke and he fell with them)' (Yin 1981: 110)

The predicates *tõu/tõuɬouʔ* 'tremble' "… describe a physical state of the subject that typically is a reflex of a particular psychological or physiological state" (Levin 1993: 224). In (52), the function of *-θwà* 'GO' is to describe the time span between the Undergoer's previous state and the entrance in the new state as minimal, as it is the case with punctual events. This view is supported by the discourse function of this clause, which introduces a foregrounded/perfective event, a typically punctual event that contributes to advance the overall plot. In (53), on the other hand, the change of state marked by *-la* 'COME' is seen as having occurred over some time. It has the discourse function of setting the background for the scene that follows (Kyaung Thu falling from the tree with the branches), which is typically realised by an imperfective, non-punctual event.

4.2.3 -θwà 'GO' *and* -laiʔ 'FOLLOW'

In addition to these uses, *-θwà* 'GO' is also employed in alternation with the marker *-laiʔ* 'FOLLOW', derived from the motion verb *laiʔ* 'follow', to indicate agentivity/valency alternations.

Let us consider the following examples:

(54) *mənégá* *jekʰɛ̀* *əjipjɔ = θwà = tɛ*
yesterday ice melt(INTR) = GO = REAL
'Yesterday, the ice melted'

(55) *mənégá* *kʰwɛʔ* *kwɛ̀ = θwà = tɛ*
yesterday cup break(INTR) = GO = REAL
'Yesterday, the cup broke'

(56) *mənégá* *bõ̀u* *pauʔkwɛ̀ = θwà = tɛ*
yesterday bomb explode(INTR) = GO = REAL
'Yesterday, the bomb exploded'

Their common structure can be visualised as follows:

(57) [SUBJ$_U$ V$_{INTR}$- *θwà* 'GO' *-tɛ* 'REALIS']

The cause (whether an animate or inanimate Actor) that has brought about the change of state undergone by the entities involved in these events (ice, cup, bomb) has been left unspecified because unknown, non-existent or irrelevant to the context of utterance.

The presence of an Actor transforms the sentences into the following:

(58) *mənégá* *tɕəmá* *jekʰɛ̀* *pʰjɔ = laiʔ = tɛ*
yesterday I ice melt(TR) = FOLLOW = REAL
'Yesterday, I melted the ice'

(59) *mənégá* *tɕəmá* *kʰwɛʔ* *kʰwɛ̀ = laiʔ = tɛ*
yesterday I cup break(TR) = FOLLOW = REAL
'Yesterday, I broke the cup'

(60) *mənégá* *tɕəmá* *bɔ̃̀u* *pʰauʔkʰwɛ̀ = laiʔ = tɛ*
yesterday I bomb explode(TR) = FOLLOW = REAL
'Yesterday, I exploded the bomb'

The causative clauses share the following structure:

(61) [$SUBJ_A$ OBJ_U V_{TR}-*laiʔ* 'FOLLOW' -*tɛ* 'REALIS']

The semantic relation between the subject in (57) and the object in (61) is evident and brings us to the well-known discussion in the literature on which structural and semantic strategies languages adopt to signal the connection between a lower degree in agentivity and decreased valency in the clause. What is particularly interesting in these structures is the use of the two markers -*θwà* 'GO' and -*laiʔ* 'FOLLOW'.

The choice between these markers seems to be iconically/semantically motivated.

The marker -*θwà* 'GO', which used with motion verbs denotes the departure of an entity from its usual location (its DC), is used in (54–56) to denote the departure of the entity from its usual state (conceptualized as its DC). On the other hand, the idea of spatial contiguity and sequentiality between two entities moving on the same path (A….> B….>) implied in the semantics of *laiʔ* 'follow' has been metaphorically extended to include contiguity and sequentiality in time, which, in turn, have been re-analysed into a relation of direct causation and result between the entities involved marked in Burmese by -*laiʔ* 'FOLLOW', as shown in (58–60). An instance of the semantics of this verb is seen in this English example:

(62) Disease often follows (from) starvation because the body is weakened

Entity A (*disease*) 'follows' entity B (*starvation*), in that it comes after, i.e. it results from, entity B. The relation of temporal proximity and succession between two entities is therefore metaphorically extended to a relation of direct causation and result between them, and their ordering reflects the order of causation, with A being the result of a situation triggered by B.

4.2.4 -θwà 'GO' *and anticausativity*

A structure like (57), repeated here for convenience:

(63) [SUBJ$_U$ V$_{INTR}$- *θwà* 'GO' *-tɛ* 'REALIS']

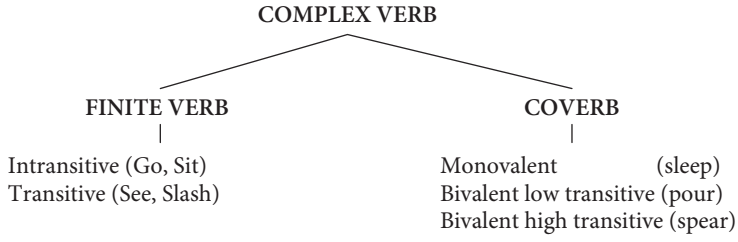
has been referred to in the literature as *anticausative*, in that the change of state that affects the Undergoer (in most cases an inanimate entity) takes place spontaneously, i.e. without the intervention of an Actor ('the cup broke/has broken'). The anticausative contrasts with the prototypical passive and the so-called *agentless passive*, in which the Actor is either demoted to the status of peripheral argument (such as 'by the dog' in 'the cup was broken by the dog') or omitted altogether even though considered as implied ('the cup was broken [by someone]'). What prototypical passives, agentless passives and anticausatives have in common is their use as markers of the decreased importance of the Actor and the correspondent increased salience of the Undergoer. In Burmese, this function is marked by *-θwà* 'GO'.

In the collection of studies on valency edited by Dixon and Aikhenvald (2000), many languages, such as Athapaskan (Rice 2000), and Amharic (Amberber 2000), signal the anticausative by means of derivational markers. On the other hand, the Australian language Ngan'gityemerri (Reid 2000), spoken in the Daly River region of the Northern Territory, possesses a construction that has anticausative effect and that shows an interesting similarity to our construction with *-θwà* 'GO'.

In Ngan'gityemerri, there are two types of verbs, *simple verbs*, that consist of verbs inflected for tense, aspect and modality, with prefixes cross-referencing their Actor/Subject and suffixes cross-referencing their Undergoer/Object, and *complex verbs*, consisting of a simple verb (Reid calls it '*finite verb*' in its grammaticalised use, a marker in our terminology) and a lexical coverb (the main verb in our terms), mostly in that order. In addition, Reid stresses the fact that the finite verb and the coverb have their own transitivity/valency paradigms, and when they are used together, their combined transitivity/valency is responsible for the transitivity/valency value of the complex verbs.

The structure of Ngan'gityemerri complex verbs and the transitivity/valency values of finite verbs and coverbs that compose them are shown in the following diagram:

(64)



As Reid (2000: 337) states, usually it is not difficult to determine the semantic contribution of each verb to the overall meaning of a complex verb, as in:[2]

(65) *ngi-rim-fifi*
1SGS-Sit-smoke
'I'm smoking (sitting) (Reid 2000: 2a–338)

(66) *nge-rim-Ø-kalal*
1SGA-Hands-3SGO-rustle
'I rustled it (with my hands) (Reid 2000: 3a–338)

However, there are many complex verbs where the use of the finite verb has been metaphorically extended to express more abstract concepts and it is precisely this use of Ngan'gityemerri finite verbs that is similar to the use of Burmese grammatical markers.

For my purposes, I am particularly interested in one combination, namely that between intransitive finite verbs and high transitive coverbs, a combination that produces intransitive clauses with the subject corresponding to the object of the transitive clause and that has anticausative effect. For instance:

(67) a. *nge-rim-Ø-pal*
1SGA-Hands-3SGO-break
'I broke it'

b. *ye-nim-pal*
3SGS-Go-break
'It is broken' [Reid 2000: 30–347]

a. *da-ngim-Ø-baty*
3SGA-Poke-3SGO-sew
'She's sewing it'

b. *ye-nim-baty*
3SGS-Go-sew
'He's twisted up' (Reid 2000: 33–347)

a. *nge-rim-Ø-tum*
1SGA-Hands-3SGO-bury
'I sank it'

b. *ngi-rim-tum*
1SGS-Sit-bury
'I'm sinking' (Reid 2000: 31–347)

In (67a), high transitive coverbs (break, sew, bury) are combined with transitive finite verbs (Hands, Poke), producing high transitive verbs with A and O cross-referencing. In (67b), the same high transitive coverbs are combined with intransitive finite verbs (Go, Sit), yielding anticausative clauses, where the Undergoer of a highly transitive verb appears expressed as the only argument and where the Actor has been deleted.

We have seen a similar type of alternation in Burmese (exs. 54–56 and 58–60). The non-causative/intransitive verbs *kwɛ̀* 'break (INTR)' and *əjipjɔ* 'melt (INTR)' in (54–56) are both marked by *-θwà* 'GO', although displaying different Aktionsarten (achievement and accomplishment respectively). The only argument SUBJ in the clauses represents the entity that undergoes the change of state, while the Actor has not been specified. These constructions contrast with causative/transitive clauses

2. For ease of consultation, single underlining has been used to identify finite verbs and double underlining to identify coverbs.

(58–60), where the verbs *kʰwè* 'break (TR)' and *pʰjɔ* 'melt (TR)' are the causative counterparts of the verbs in (54–56) and where the presence of an Actor effectively performing a certain activity on the Undergoers 'ice', 'cup' and 'bomb', identified by the overt core arguments, is obligatory. Most importantly, these sentences differ in the choice of the marker marking the main verb, *-θwà* 'GO' for (54–56) and *-lai?* 'FOLLOW' for (58–60).

At first glance, the similarities between examples (67b) in Ngan'gityemerri and (54–56) in Burmese are striking: the two languages even use the same lexical source *go* to grammaticalise reduced agentivity. On the other hand, in Ngan'gityemerri the degree of transitivity/valency of the complex verb is determined by the combination of the degree of transitivity of both the finite verb (marker) and the coverb (main verb). In actual fact, it is the valency of the finite verb that determines the transitivity value of the whole complex verb.

On the other hand, the degree of causation in Burmese may be a feature of specific verbs, signalled by the aspiration of the consonant in the onset, which originated from the assimilation of the PTB prefix **s-*, marker of causation, or a feature of the verb complex, morphologically marked by the productive verbal marker *–se* 'CAUSE', derived, according to Okell (1969: 406), from the full verb *se* 'send, dispatch, command'. In these examples, the semantic value of the marker does not control the semantic value of the whole clause and the choice between the two Burmese markers may have been motivated by the need to maintain the same transitivity value over the whole verb complex, a phenomenon that has been shown to occur elsewhere. For instance, LaPolla informs us that, in the Tibeto-Burman language Dulong/Rawang, the valency-reducing reflexive/middle marker *-shì* is used to transform transitive verbs into intransitive showing a component of volition (LaPolla 2000: 289–295):

(68) a. *tv́l-ò-ē*
roll-3+TR.N.PAST-N.PAST
'to roll' (transitive) (LaPolla 2000: 288)

b. *tv́l-shì-ē*
roll-R/M-N.PAST
'to roll oneself (on purpose; intransitive, but with intention)'
(LaPolla 2000: 291)

There are cases, though, where *–shì* has the sole function of intransitivising auxiliaries in order for them to match the intransitivity of the main verbs. For example:

(69) *àng-í* *shǿng* *rí-mv̄n-ò-ē*
3SG-agt tree/wood carry-continue-3+ TR.N.PAST-N.PAST
'He is continuing to carry the wood' (LaPolla 2000: 18a–293)

(70) *àng* *yøp-mv̄n-shì-ē*
3SG sleep-continue-R/M-N.PAST
'He is continuing to sleep' (LaPolla 2000: 18b–294)

Interestingly, we do find in Burmese occurrences of *-θwà* 'GO' marking agentive/transitive constructions:

(71) a. *tɕʰotɕʰĩ = ko sa = ta twé = ló θú = ko jaiʔ = laiʔ = tɛ*
sweets = OBJ eat = DEV_{REAL} meet = BECAUSE he = OBJ beat = FOLLOW = REAL
'[I] beat him because [I found him eating sweets'

b. *tɕʰotɕʰĩ = ko sa = ta twé = ló θú = ko jaiʔ = θwà = tɛ*
sweets = OBJ eat = DEV_{REAL} meet = BECAUSE he = OBJ beat = GO = REAL
'He was beaten (= someone beat him) because [he] was found eating sweets'

In both instances, we are dealing with *jaiʔ* 'beat', a verb that entails the existence of an animate Actor performing a particular physical activity on an Undergoer. In the prototypical transitive sentence (71a), the marker *-laiʔ* 'FOLLOW' (derived from a transitive verb) marks the overt, iconic relation between the Actor, who is narrating the occurrence of the event, and the Undergoer. In (71b), the speaker is narrating the occurrence of the event performed on the Undergoer by an Actor that is unknown. Because the main verb implies a high degree of agentivity, and because of the need to show the reduced salience and/or individuation of the Actor, the marker *-laiʔ* 'FOLLOW' is replaced by *-θwà* 'GO', a marker derived from an intransitive verb and thus showing reduced valency.

More interesting is the use of *-θwà* 'GO' in the following example:

(72) *mãutɕʰo = ko θa̰udʑa̰ðu = to = ká pʰa̰ = θwà = tɕa̰u*
Maung.Kyo = OBJ insurgent = PL = SUBJ capture = GO = ABOUT
θí = já = θəpʰjĩ́ mjà = swa θɔgá jauʔ = tɕá = já = le = ɪ́
know = GET = BECAUSE much = ADV anxiety arrive = PL = GET = EU = REAL
'[Maung Kyo's parents] were much distressed when [they] came to know that Maung Kyo was captured by the insurgents'

Both the Actor (the insurgents) and the Undergoer (Maung Kyo) are present in the structure, but their unmarked order of occurrence A-U has been changed into the marked U-A. Here again, the focus is no longer on the Actor, but on the Undergoer, and this change in salience is marked by a shift in the valence of the marker, which, in turn, marks the main verb as being less Actor-oriented or less 'agentive'.

In the following example, the same verb *pʰa̰* 'capture' is interestingly marked by *-la* 'COME':

(73) *tɕa̰uðà = tó = ká ŋa = tó = ko = tɔ́ pʰa̰ = la = ta*
student = PL = SUBJ I = PL = OBJ = TOP capture = COME = DEV_{REAL}
mə = houʔ = pa = pʰù = kwa
NEG_1= be.SO = POL = NEG_2 = ADDRESS
'The students [said]: We were not captured'

The use of *-la* 'COME' here marks an activity seen from the viewpoint of the speaker, i.e. the Undergoer. It is the goal of the activity (the students who were captured) which is the focus of the sentence, not the source (the Actor).

4.2.5 *Other uses of* -θwà 'GO'

Finally, *-θwà* 'GO' is used with predicates denoting the exit from states that are seen as the most natural/positive, whose trajectory of motion away from the natural state is considered to be irreversible, in clear contrast with *-la* 'COME'. One typical instance is its use with the verb *θes^{h}õ̀u* 'die':

(74) *mj̃ìtɕã̀ = tɕì = θi* *tə = ʃẽi = t^{h}ɛ̀*
horse = be.big = SUBJ all.the.time = speed(N) = INSIDE
pjè = la = ja *tɔ̀nɛʔ = twĩ = θó* *jauʔ = θɔ̀*
run = COME = WHILE thick.forest = IN = TO arrive = REL$_{REAL}$
ək^{h}a *əmɔ̀s^{h}ó = jwé* *θes^{h}õ̀u = θwà = le = í́*
time be.choked.with.exhaustion =AND die = GO = EU = REAL
'When the horse arrived in the forest running at high speed, [it] was choked with exhaustion and died (i.e. left the world)' (Yin 1981: 108)

The exit from the normal or preferred state of being alive, marked by *-θwà* 'GO', is counterbalanced by the entry in the same state, indicated by the verb *mwè* 'be born', marked by *-la* 'COME':

(75) *nauʔ-t^{h}aʔ* *tɕãu = ŋɛlè-tə = kãu* *mwè = la = pjã = le = í́*
further-again cat = small-1 = CLASS be.born = COME = ITERATIVE = EU = REAL
'Another kitten was born' (Yin 1981: 20)

Other examples of this use are the following:

(76) *θu* *mjɛʔsí́* *kwɛ = θwà = θi*
he sight go.blind = GO = REAL
'He went blind'

(77) *tɕənɔ = tó-tətwe = né* *tɕənɔ = tó = jé* *míbá = twe = ká* *di*
I = PL-all.the.others = AND I = PL = POSS parent= PL = SUBJ this
jekã *tẽikɔ̀ = θwà = m̥a = ko* *sòjẽi = ne = tɕá = pa = tɛ*
pond silt.up = GO = IRR = OBJ be.worried = CONT = PL = POL = REAL
'We and our parents are afraid that this pond may silt up' (Yin 1981: 74)

(78) *le-taiʔ = t^{h}ɛ̀ = twĩ* *p^{h}əjã̀udãi-mì* *ɲɛ̀i = θwà = θi*
wind-blow = INSIDE = AT candle-fire die.out = GO = REAL
'The candle went out in the wind'

The high frequency of use of *–la* 'COME' with stative verbs is counterbalanced by the low occurrence in the same context of *-θwà* 'GO'. I have found only two examples of its use with stative verbs:

(79) *sʰəjamá = ði* *ətɔ* *ʔə̃nʔɔ̀ = θwà = θi*
teacher(FEM) = SUBJ quite be.amazed = GO = REAL
'The teacher was quite amazed' [Okell 1994: 102]

(80) *kʰaʔ-ɬə̀ɬə̃ = n̥aiʔ* *θənaʔ = ko* *tʰə̃ = ka* *əɬéʤá* *sə̃́u = ne = θí*
rather-be.far = AT gun = OBJ carry = AND in.turn keep.guard = CONT = REL_{REAL}
θə̃udʒə̀ðu-tə = jauʔ = ko *ɬə̀-mjĩ = laiʔ = já = θɔ̀* *əkʰa*
insurgent-1 = CLASS = OBJ reach.out-see = FOLLOW = GET = REL_{REAL} time
po = jwé *seiʔɲiʔ = θwà = ʃa = le = í́*
be.in.excess = AND be.sad = GO = PITY = EU = REAL
'[He] became very sad when [he] saw an insurgent standing guard at a distance with a gun on [his] shoulder'

The entrance in the new state is seen as having occurred suddenly and/or unexpectedly, as in the first example, or as having occurred simultaneously with another event, as in the second example ('he became sad as he saw the insurgent').

5. Conclusion

This paper has analysed the grammatical uses of the Burmese motion verbs *la* 'come', *θwà* 'go' and *laiʔ* 'follow'.

With motion verbs, the markers *-la* 'COME' and *-θwà* 'GO' specify the direction of motion of the core arguments, i.e. of the participants in the motion event, vis-à-vis their respective main location (the deictic centre – DC).

In dialogues, *-la* 'COME' marks the motion event as directed towards the DC, while *-θwà* 'GO' marks the motion event as directed away from the DC.

In narratives, *-la* 'COME' orients motion towards the actual, habitual or intended location of the character(s) involved in a particular context and considered to be the narrative pivot(s). On the other hand, *-θwà* 'GO' orients motion away from the viewpoint of the character(s) involved in a particular section of narrative discourse and from their common location.

With non-motion verbs, *-la* 'COME' and *-θwà* 'GO' mark an entity's change of state and the attainment of the goal of the change (the new state) either through progression in time (*-la* 'COME') or instantaneously (*-θwà* 'GO'). They have therefore inchoative/ingressive function, and may be grouped among those grammatical forms whose function is to mark aspect.

The idea of spatial contiguity and sequentiality implied in the semantics of *laiʔ* 'follow' has been metaphorically extended to include contiguity and sequentiality

in time, which, in turn, have been re-analysed into a relation of direct causation and result between the entities involved marked by *-lai?* 'FOLLOW'. This form marks the clause/sentence as highly transitive, whereas *-θwà* 'GO' marks a decrease in the degree of transitivity of the clause by backgrounding the Actor and foregrounding the Undergoer. Such a construction, called *anticausative*, has been shown to occur frequently cross-linguistically and an interesting example of similarity between genetically unrelated languages has been described.

The paper has provided further evidence of the role of metaphor as a pervasive means of semantic change. The change from the lexical status of the three Burmese motion verbs *la* 'come', *θwà* 'go' and *lai?* 'follow' to their grammatical function as markers of aspect and valence is an instance of semantic change which is metaphorically motivated. I have shown how the trajectory of physical motion for *la* 'come' and *θwà* 'go' and the way in which entities share the motion event expressed by *lai?* 'follow' have been extended to express aspectual and valency notions respectively.

List of abbreviations

CLASS	Classifier	NEG_1	Pre-verbal negative
DEV_{REAL}	Realis Deverbaliser	NEG_2	Post-verbal negative
EU	Euphonic	NEG.IMP	Negative imperative
IMP	Imperative	QUOT	Quotative
INT	Interrogative	REAL	Realis
INTR	Intransitive	REL_{REAL}	Realis Relativiser
IRR	Irrealis	SUBJ	Subject
NEG	Negative	TOP	Topic
OBJ	Object	TR	Transitive
PFV	Perfective	CONT	Continuous
PL	Plural	POL	Polite
POSS	Possessive		

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Irrealis in Yurakaré and other languages

On the cross-linguistic consistency of an elusive category*

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The linguistic category of irrealis does not show stable semantics across languages. This makes it difficult to formulate general statements about this category, and it has led some researchers to reject irrealis as a cross-linguistically valid category. In this paper we look at the semantics of the irrealis category of Yurakaré, an unclassified language spoken in central Bolivia, and compare it to irrealis semantics of a number of other languages. Languages differ with respect to the subcategories they subsume under the heading of irrealis. The variable subcategories are future tense, imperatives, negatives, and habitual aspect. We argue that the cross-linguistic variation is not random, and can be stated in terms of an implicational scale.

1. Introduction

Despite their widespread use, particularly in descriptions of languages of the Americas, Papua New Guinea and Austronesia (Palmer 2001: 145; Elliott 2000: 56), the terms 'realis' and 'irrealis' do not have a well defined semantic content. Languages make different choices in which categories are subsumed under the heading of 'irrealis' and 'realis'. For this reason, it is hard to come up with a language-independent characterization of irrealis. This has led Bybee, Perkins and Pagliuca (1994: 236–40) to the conclusion that the validity of irrealis as a useful (i.e. comparable) category for cross-linguistic research is highly doubtful. Other authors, on the other hand, have argued for the usefulness of the irrealis as a cross-linguistic category. Mithun (1995: 386), for example, concludes that the category of irrealis is comparable across languages; in fact, she claims that there is "complete accord" across languages as to the basic semantic underpinnings of irrealis.

*We would like to thank the people of Loma del Masí, Nueva Lacea and San Pablo for sharing their knowledge with us. We furthermore thank Paul Kockelman, Pieter Muysken, the editors and two anonymous reviewers for commenting on earlier drafts of this paper. All remaining errors are ours.

In this paper we will look at the realis-irrealis distinction in Yurakaré, an unclassified language of central Bolivia, spoken by approximately 2500 speakers, and compare it to a number of other languages. Yurakaré marks the distinction between realis and irrealis in two constructions: same-subject clause chaining and emphatic predicate repetition. In these constructions, the irrealis marker co-occurs with certain TAM affixes, allowing us to see which categories are subsumed under the heading of 'irrealis' in Yurakaré.

In comparing the irrealis domain of Yurakaré to other languages, we will look at four categories that are classified differently across languages: future tense, imperatives, negatives and the habitual. We will argue that, in spite of the cross-linguistic differences, an implicational hierarchy can be established that constrains this diversity, and that there is a language-independent semantic content underlying the irrealis category.

We will start by giving a short description of the TAM system of Yurakaré in Section 2. Then we will discuss the realis-irrealis distinction in Yurakaré (Section 3). In Section 4 we will compare the irrealis category of Yurakaré to other languages and discuss the differences. In Section 5, finally, we will propose a generalized approach to account for the cross-linguistic differences.

2. The TAM system of Yurakaré

In this section we will discuss the morphological marking of tense, aspect and modality in Yurakaré. For reasons of space, this will be a very compact description. For a more detailed account the reader is referred to Van Gijn (2006: 181–203). The verbal template in Yurakaré is given in Table 1 (places for TAM markers are bold, the double line before position 4 means that the markers in position 4 and 5 are enclitic particles):[1,2]

Table 1. Yurakaré verbal template

-4	-3	-2	**-1**	0	1	**2**	3	**4**	**5**
IMP. PL	OBJ	APPL	**ASP**	ROOT	DER	**TAM**	S	**MOD**	**ASP,** DISC

1. These three positions are based on morphosyntactic behaviour and thematic coherence, and do not form strict paradigms, i.e. there are some co-occurrence possibilities within each modality slot. They seem to be restricted to at most two markers per position.

2. A full list of abbreviations can be found at the end of the paper.

Tense is marked at position 2 in the template. There is a basic opposition in Yurakaré between future (*-shta*) and non-future (unmarked):

(1) a. *tishilë bobo-y ti-tib talipa*
now hit;kill-1SG.S 1SG-pet chicken
'I just killed my chicken.'

b. *tishilë mi-la-bobo-**shta**-tu*
now 2SG-AFO-hit;kill-FUT-1PL.S
'Now we are going to kill him (to your detriment)!'

The future marker can take on aspectual meanings (inchoative) or modal meanings (commissive, intentional), but its main function is to situate the event at a moment after the speech event or after a narrated event.

Aspect is marked at three different places in the template. There are two prefixes, *a-* (incompletive) and *i-* (distinct subevents). The latter prefix is often combined with the suffix *-uma*, or a reduplicative suffix (in position 2 on the template) which indicate multiple instances of events (verbal plural). Also in position 2 is the marker for habitual aspect *-jti*:

(2) *latijsha ati lëtta yee chërë-**jti**-ø=ya na ulë*
then DEM one woman scratch-HAB-3=NE DEM guayabochi.tree
'Then there was this woman, who used to scratch this guayabochi.'

Two other aspectual suffixes are found on position 2: *-lë* 'recent perfective' and *-nishi* 'near perfective'.[3] Finally, there are aspectual enclitics found in position 5. These clitics are actually not restricted to the verb as their host, they can appear on other words as well. The aspectual enclitics are *=se* 'repetitive', *=naja* 'discontinuative' (marks the fact that the situation expressed in the proposition replaces another), and *=bëla* 'continuative'.

Like aspect, modality is found on several positions on the verbal template. Event modality,[4] pertaining to the (non-)realization of events, is expressed by means of affixes, propositional (epistemic and evidential)[5] modality is expressed by means of enclitics.

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3. Unfortunately, because of a lack of data, we cannot include these suffixes in the analysis of the irrealis.

4. Event and propositional modality are terms we take from Palmer (2001: 7). The former refers to modal operations at the event level, and subsumes dynamic and deontic submodalities. The latter refers to modal operations on the propositional level (epistemic and evidential).

5. There is some disagreement with respect to the status of evidentiality. Some authors (e.g. De Haan 1999; Aikhenvald 2004) consider it to be a separate category, whereas others (e.g. Palmer 2001; Bybee & Fleischman 1995) claim that it is part of modality. Since evidentiality

With the exception of a prefix marker for imperative plural, event modality markers are found in position 2, right before the subject markers. The marker *-ni* encodes intentionality on the part of the agent, see (3a), *-ta* marks a conceivable, often counterfactual event, (3b), and *-nta* a desired event, (3c):[6]

(3) a. *at=chi mala-**ni** ta-ø=ya*
DEM=DIR go.SG-INTL:1SG.S say-3=NE
'"I am going there now", he said to him.'

b. *ati ka-puppu-**ta**-ø bobo-ø=y=chi laij=la=ye*
DEM 3SG-make.loose-POT-3 hit;kill-3=NE=IGN too=VAL=NB.F
'Had he cut that one loose, he would have killed him as well.'

c. *sisë-**nta**=ya nish poyde a-sisë-jti-ø=w=ya*
touch-DES=NE NEG can INC-touch-HAB-3=PL=NE
'They wanted to touch them, but they could not.'

Furthermore, there is a marker for jussive *-cha*, and for obligative *-iba*, exemplified in (4a) and (4b) respectively:

(4) a. *dula-**cha**-p onno*
make-JUS-2PL.S tamale
'Make some tamale.'

b. *nij sawata-**iba**-m=chi*
NEG work-OBL-2SG.S=IGN
'You shouldn't work.'

In addition, Yurakaré has the following imperative affixes: singular (*-ma*), plural (*-pa*, and an alternative prefix *pi-*) and a prohibitive marker *-yu*, see the examples in (5).

(5) a. *ta-n-tütü-**ma**=bë*
PL-IO-be-IMP.SG=MOM
'Wait for us a minute!'

b. ***pi**-peta ati*
IMP.PL-lie(down).PL DEM
'Lie down over there!'

c. *dele-**yu***
fall.SG-PROH
'Don't fall!'

Propositional modality in Yurakaré is a mix of epistemic and evidential modality that is hard to disentangle. We will not go into this complicated system here, since

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and epistemic modality cannot easily be separated in Yurakaré, we include evidentiality into the modal domain. For a detailed account of the Yurakaré evidentials, cf. Gipper (in prep.).

6. The marker *-nta* is very likely a grammaticalized combination of *-ni* and *-ta*.

it is not of direct importance for the point in this paper, as it does not interact with the realis-irrealis distinction. We will, however, look at one of the markers within the epistemic/evidential system that is also used to mark irrealis, as we will see in the next section. The marker in question is *=ya*, which, within the epistemic/evidential paradigm, is used when the speaker, not having directly experienced an event, does not commit him/herself fully to the proposition.[7] This general function can have several readings depending on the context. The marker is often found in mythological narratives, where it has a hearsay function. In other contexts it indicates probability, expectations, suppositions and the like:

(6) a. *aj ashiwa-ø=**ya** noe li-lojo-ø=**ya** noe*
INTJ lie-3=NE Noah DEL-mad-3=NE Noah
'Oh! Noah will be lying, he's probably gone crazy'.

b. *maj-matata ti-jusu-ø=la nish ta-bibë-shta-ø=**ya***
INTS-big 1SG-want-3=VAL NEG 1PL-suffice-FUT-3=NE
'I want a bigger [plantation]. This one wouldn't do for us.'

c. *sawata-ø=**ya** ani*
work-3=NE DEM:LOC
'Do you suppose it is working? [the minidisk]'

We will now turn our attention to the two constructions in which the realis-irrealis opposition surfaces.

3. The realis-irrealis distinction in Yurakaré

In his cross-linguistic study of mood and modality, Palmer (2001: 145) claims that there are basically two ways in which languages deal with realis and irrealis markers: either they co-occur (joint systems), or they do not co-occur (non-joint systems) with markers of other, more specific, grammatical categories.

For the constructions of same-subject clause chaining and emphatic predicate repetition, Yurakaré exemplifies the joint system, where the marker for irrealis co-occurs with the more specific TAM affixes, the irrealis marker on one predicate, and the specific TAM markers on the other. We will now briefly discuss these two environments in which a realis-irrealis distinction is marked.

3.1 Switch reference

In the subordination system of Yurakaré, the language makes a difference between main and dependent events with identical subjects and events with different

7. We thank Paul Kockelman for drawing our attention to the evidential nature of this marker.

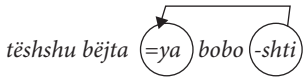
subjects.[8] Dependent predicates that have a different subject than the main predicate are marked with the enclitic *=ti*. For same-subject dependent clauses, there is a choice between *=ja*, for realis events, and *=ya* for irrealis events,[9] the latter showing no person marking and restricted possibilities for TAM marking. The distinction between realis and irrealis same-subject marking is illustrated in (7):[10]

(7) a. *mi-bëjta-y=**ja*** *shudyuj-ta-y*
2SG-see-1SG.S=SS hidden-MID-1SG.S
'When I saw you I hid myself.'

b. *tëshshu bëjta=**ya** bobo-**shti***
weasel see=NE hit;kill-FUT:1SG.S
'If I see the weasle, I'll kill him.'

In (7b), the main predicate is inflected for future tense with the marker *-shta* (merged with the marker *-y* for first person here). This future marker has scope over the medial clause, and determines the appearance of *=ya*.

(8)



Apart from future tense, the *ya*-marked medial clauses also co-occur with all position 2 markers described in Section 2. A number of examples (for imperative, intentional and habitual) are given in (9).

(9) a. *mala=**ya*** *ayee-**ma*** *losko=chi*
go.SG=NE vomit-IMP.SG creek=DIR
'Go and vomit at the creek.'

b. *tomete dula=**ya*** *ku-**bay**-tu*
arrow make=NE 3SG.CO-go.PL.INTL-1PL.S
'Let's make some arrows and follow him!'

c. *ma-otche-shta=**ya*** *ma-ma-n-dula-**jti**-ø=w* *yarru*
3PL-go.out.CAU-FUT=NE 3PL-3PL-IO-do;make-HAB-3=PL chicha
'Before getting them out, they made them chicha.'[11]

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8. The system is actually based on a switch of perspective rather than subject (cf. Van Gijn forthc.). For the sake of clarity we ignore this complication here.

9. The appearance of *=ya* or *=ja* is not phonetically triggered: even though it does not appear from the examples here, both markers can follow a vowel as well as a consonant.

10. We do not gloss the markers *=ja* and *=ya* 'realis' and 'irrealis', respectively, because they both have other, in our view primary, functions.

11. The 'before' interpretation of this clause is determined by the presence of the future marker in the medial clause, which situates the event in time relative to the event expressed in the final clause.

In all of these examples, the TAM markers of the finite predicate take scope over the *ya*-marked predicate.

3.2 Emphatic predicate repetition

Another domain where *=ya* and *=ja* are paradigmatic opposites is the domain of emphatic repetition. In quoted speech within narratives, verbs can be repeated to add emphasis or urgency. The repeated verb carries either the marker *=ya* for irrealis events, or the marker *=ja* for realis events. In the former case, the repeated verb is also stripped of its inflection. The same TAM categories that can trigger medial clauses marked with *=ya* discussed in the previous section, can trigger the ya-form of the repeated predicate. Examples of this construction are the following:

(10) a. *ushpë-**n**-tu* *ushpë=**ya***
bathe-INTL-1PL.S bathe=NE
'Let's bathe!'

b. *më-jti* *che-**cha**-m* *che=**ya***
2SG.PRN-LIM eat-JUS-2SG.S eat=NE
'You eat!'

Predicates in utterances featuring realis events can also be repeated, but then they carry the marker *=ja*, and they are inflected:

(11) a. *ti-wështi* *wita-y=laba* *wita-y=**ja***
1SG-hunger arrive.SG-1SG.S=PRS arrive-1SG.S=SS
'I arrived hungry!'

b. *ëshë achuta* *atarassa-m=chi* *atarassa-m=**ja***
why like.that be.late-2SG.S=IGN be.late-2SG.S=SS
'Why are you so late?'

3.3 A notional characterization of irrealis in Yurakaré

Now that we have seen which TAM markers determine the appearance of the irrealis *=ya* marker, we can come to a notional characterization of irrealis in Yurakaré. The event modalities (intentional, potential, desiderative, obligative, jussive, imperative and prohibitive) as well as future tense mark events that have not (yet) taken place, do not (yet) form part of the real world. This is unproblematic as a definition of irrealis, given by a number of authors (e.g. Chung & Timberlake 1985: 241). However, habitual aspect is also part of the irrealis field in Yurakaré. Givón (1994: 270) suggests that habitual aspect is ambiguous with respect to its modal status, having characteristics associated with realis (strongly asserted) as well as with irrealis (non-specific in terms of time, place and possibly reference). Furthermore Comrie (1985: 40) points out that "habituality can also be modal, since it involves an induction from limited observations about the actual world to a

generalisation about possible worlds." This latter observation also fits particularly well with the evidential meaning of the marker *=ya* as 'non-experienced'. We can conclude by saying that irrealis in Yurakaré refers to events that are hypothetical and/or atemporal. With this latter term we do not mean that the time point of the event is vague or left implicit, but rather that the event does not even have a conceptual temporal reference. In one sense this happens with 'generic events', which "do not express specific episodes or isolated facts, but instead report a kind of general property, that is, report a regularity which summarizes groups of particular episodes or facts" (Krifka et al. 1995: 2). In another sense, as we will see in the discussion of Yimas below, it can happen with events that take place in an extratemporal space, such as the so-called legendary past of that language.

4. The category of irrealis in other languages: Four points of comparison

Mithun (1995) indicates three areas where languages differ in their classification of irrealis: future tense, imperatives and negatives/questions.[12] To these three we can add a fourth: the habitual. We will look at the irrealis category in a number of other languages that draw the line between realis and irrealis at different points.

4.1 Future tense

Future tense is not uniform in its categorization as either realis or irrealis across languages. As we have seen, future tense is an irrealis category in Yurakaré. Another language that classifies future tense as irrealis is the Papuan language Amele (Roberts 1990). In this language, like in Yurakaré, the realis/irrealis distinction is found in the subdomain of clause-chaining and is determined by the TAM categories of the final verb. Where in Yurakaré the distinction is only marked on same subject clauses, in Amele it is only marked on medial verbs indicating simultaneous actions with different subjects, which have two sets of subject agreement markers (ibid.: 370–372):

(12) a. *Ho bu-busal-en age qo-in*
pig SIM-run.out-3SG.DS.REA 3PL hit-3PL.REM.P
'They killed the pig as it ran out.'

b. *Ho bu-busal-eb age qo-qag-an*
pig SIM-run.out-3SG.DS.IRR 3PL hit-3PL-FUT
'They will kill the pig as it runs out.'

12. We will not consider questions in this paper, since the data we have are too scarce to draw any firm conclusions. In Yurakaré, a question does not change the reality status of the proposition.

As can be seen from the examples, future tense in the final verb triggers irrealis in the medial clause, like in Yurakaré. The other categories that trigger the irrealis person markers in the medial verb are imperative, prohibitive, counterfactual, prescriptive, hortative, and apprehensive (ibid.: 371).

Yimas, another Papuan language, has an irrealis category (non-joint) that is described as indicating "events which are located outside of the continuum of real time: they must be completely timeless, in the legendary past or in the indefinite future" (Foley 1991: 237). The TAM system of Yimas is schematized in Table 2 (ibid.):

Table 2. The TAM system of Yimas

EVENTS								
UNREAL	REAL							
	PAST			PRESENT			FUTURE	
	REM	FR	NR	PRF	IPF	HAB	NR	REM

The irrealis can be used to refer to future events to express the temporal unspecificity of the event, as the following example shows (ibid.: 237):

(13) a. *ama* *patn* *wak-k*
1SG betelnut.CL5.SG buy-IRR
'I want to/will buy betelnut.'

b. *patn* *na-ka-wayk-kt*
betelnut.CL5.SG OBJ-1SG.AG-buy-REM.FUT
'I will buy betelnut after tomorrow.'

In Yimas, the realis/irrealis distinction does not seem to be so much between real and unreal events (as future events are not necessarily irrealis), but rather between temporal and atemporal events.

Caddo, a Caddoan language of the United States (Chafe 1995) has two sets of pronominal prefixes, one for realis events and one for irrealis events. Reality status is obligatorily marked for every utterance. Except for yes-no questions (which are irrealis), Caddo exemplifies a system of joint marking, as the pronominal prefixes are generally preceded by a more specific marker (e.g. negator, prohibitive, obligative etc.) which determines whether a realis or irrealis pronominal prefix is used. Future tense (and imperatives) are not part of the irrealis domain in Caddo. Chafe (ibid.: 358–359) gives two possible explanations for this fact. One is that, regarding (non-)reality as a gradient rather than a binary distinction, futures are more part of reality than other categories in the language because speakers have a strong expectation that the event expressed will actually take place. The other explanation he gives is that futures might represent an older layer of grammaticalized morphemes

in Caddo, which did not participate in the grammaticalization of reality status, which is then supposed to have been more recent than the grammaticalization of future tense. With regard to his second explanation, it is interesting to note that, whereas all markers of categories falling under the heading of irrealis precede the person markers, the future marker is suffixed to the root (ibid.: 356–358):

(14) a. *cííbáw?a?*
ci-yi.bahw-?a?
1.AG.REA-see-FUT
'I'll look at it.'

b. *kassánáy?aw*
kas-sa-náy.?aw
OBL-3.AG.IRR-sing
'He should/is supposed to sing.'

In relation to Chafe's first explanation, it is worth looking at the Hokan language Central Pomo, spoken in the United States (Mithun 1995). In Central Pomo, like in Yurakaré, irrealis marking manifests itself on markers for clause chaining. Linked clauses in Central Pomo are either considered to be components of one event, or they can be regarded as different events, and within this latter category there is a subdistinction between simultaneous and sequential events. For all three of the categories (same, different-simultaneous and different-sequential) there is a realis marker and an irrealis marker. With the future tense, speakers can use both realis and irrealis linkers. An example of a linked realis clause is the following (ibid.: 379):

(15) *ma-báya* *čá=·l* *yó-w=da*
PS-husband house=to go-PRF=DE.SIM.REA
?e *mu·l* *ma?á* *č^{h}ú-w=?k^{h}e*
COP that food eat-PRF=FUT
'When her husband gets home, she'll eat.'

According to an explicit comment of a speaker (ibid.: 380), the difference between this utterance and its irrealis counterpart is that the speaker commits him/herself more to the realis future than to the irrealis future. Comparing this to Caddo, then, it might be the case that in Caddo this speaker commitment (with realis marker) has grammaticalized to all instances of future tense.[13]

13. An anonymous reviewer suggested that the realis future in Central Pomo might also refer to "futurates" (Vetter 1973), i.e. future events that can be planned, as opposed to future events that cannot, which would constitute the irrealis future of Central Pomo. Unfortunately we do not have enough data of Central Pomo to check this claim. The general point, however, is that future is cross-linguistically ambiguous as an irrealis category. We thank the reviewer for this comment.

As we have seen, two important factors interfering with the differences between languages in categorizing future tense as either realis or irrealis are temporal specificity and speaker commitment. Apparently, languages differ from each other in which factor is the dominant one in determining the reality status of a category.

4.2 Imperatives

Unlike Yurakaré, in Bininj Gun-Wok (a Gunwinyguan language of North Australia) imperatives are not part of the irrealis category. Evans (2003: 372) states that the irrealis marker in Bininj Gun-Wok "is used for a variety of situations whose status is less than fully real: negated past sentences, past sentences with the meaning 'nearly' or 'about to', expressions of wish or obligation, hypotheses, certain types of yes-no questions and complements of desire predicates". From the examples that Evans cites, it seems that in many cases, the irrealis goes beyond this general characterization in that it marks counterfactual situations, which are no longer possible. We can illustrate this with the following example, where the irrealis marker is used in combination with the hearsay particle *djaying*, yielding a counterfactual interpretation (ibid.: 374):

(16) *djaying* *ba-ra-yinj* *gurih*
supposedly 3P-go-IRR there
'I thought he was going to go that way (but he didn't).'

This counterfactual meaning component of the irrealis in Bininj Gun-Wok might also be connected to the use of the irrealis marker in polar questions. Polar questions in which the negative particle *minj* and the irrealis marker are combined indicate that the speaker expects a negative answer (ibid.: 609):

(17) *minj* *kun-ra-yinj*
NEG 3.hither-go-IRR
'Didn't he come?'

The connection to counterfactuality may consist in the fact that the speaker believes that the proposition 'he came' is counterfactual.

Even though not all examples of the irrealis conform to the counterfactual interpretation, it still seems to be a strong meaning component, possibly the original meaning, after which it has grammaticalized into other areas as well (in some dialects even up to including habitual past, to which we will come back in Section 4.4).

The imperative markers in Bininj Gun-Wok cover a wide range of meanings: standard imperative, hortative, jussive, permissive, as well as deontic and dynamic modal meanings (ibid.: 362–364), the latter two are exemplified here.

(18) a. *nungka ø-ngu*
he 3P-eat.IMP
'He must eat!'

b. *ngudda yi-ray*
you 2-go.IMP
'You can go.'

The imperative in Bininj Gun-Wok mostly seems to refer to hypothetical but possible situations, whereas the irrealis indicates counterfactual, unfulfilled situations. Nevertheless, the imperative and the irrealis can be used to render similar interpretations:

(19) a. *ngaleng mak ø-keyu-n*
she must 3P-lie.down-IMP
'She must lie down.'

b. *nungka mak ø-ra-yi*
he must 3P-go-IRR
'He must go.'

Evans mentions that obligation expressed by the imperative marker requires immediate action. He does not indicate, however, in what sense the interpretation of obligation expressed with the irrealis marker differs from the imperative.

Even if the imperative and irrealis can yield similar interpretations in some contexts, it still seems reasonable to assume that the irrealis category prototypically marks counterfactual situations, whereas the imperative prototypically marks possible situations.

Another language that does not classify imperatives as irrealis is Caddo. In this language the imperative, which is unmarked, co-occurs with the realis person prefixes (Chafe 1995: 358).[14]

(20) *dáy?bah*
yah?-yi.bahw
2.AG.REA-see
'Look at it!'

It is interesting to note that Caddo also classifies the future tense as realis. As mentioned, Chafe tentatively attributes this to the fact that futures are more part of reality than other categories. He extends this explanation to imperatives as well, i.e. they also might be more part of reality, as the speaker expects the event to happen (ibid.: 358).

14. Chafe glosses *yah?-* as 'first person realis' in this example, but this is clearly a mistake, it should rather be second person realis.

In Alamblak, (Papuan, East Sepik) the imperative can occur both with realis and irrealis. The combination imperative-realis forms a simple command (Bruce 1984: 137):

(21) *(ni)* *nuat* *wa-ya-n-t*
(you) sago.patty IMP-eat-2SG-3SG.F
'You eat the sago patty!'

The combination imperative-irrealis "conveys obligation (with the illocutionary force of a command) *plus hypotheticality or contingency*" (ibid.: 139, our emphasis). This form is found in the protasis of conditional imperatives (ibid.):

(22) *wa-i-kah-n-n* *kuñko* *wa-hoe-twa- ø*
IMP-go-IRR-2SG-DEP to.house IMP-sleep-FUT.IRR.IMP/HOR-2SG
'Go to the house and if/when (you do) sleep!'

It seems to be the case then, that irrealis expresses a decreased likelihood of occurrence. This fits Bruce's (ibid.: 137) statement that irrealis in Alamblak encodes events that are not actual, and also events that "will not *with certainty* be an actuality" (italics in original).

This may also account for the use of the irrealis (in combination with future tense) in a more polite form of the imperative (ibid.: 140):

(23) *(nikë)* *wa-roh-twa-kë*
(you.PL) IMP-sit-FUT.IRR.IMP/HOR-2PL
'You all sit/be seated!'

By adding futurity and hypotheticality to the imperative, the speaker leaves the hearer with the opportunity to not fulfill the command. This might be connected to a lack of speaker commitment associated with the irrealis. Mithun (1995: 378) mentions Jamul Diegueño as another language that has both realis and irrealis imperatives. She concludes, comparing cross-linguistic differences in future tense and imperatives in relation to irrealis, that "speakers might choose to exploit the Irrealis/Realis distinction to express varying expectations of actuation" (ibid.: 385).

Concluding, languages can make different choices in classifying imperatives as either realis or irrealis, or both. In the latter case, as in Alamblak, the choice seems to be related to speaker commitment. Languages like Caddo, that classify imperatives categorically as realis, possibly regard all instances of imperatives as involving a high degree of speaker commitment. In Bininj Gun-Wok, irrealis and the imperative are distinct categories. The difference is that irrealis is mainly confined to counterfactual situations, whereas the imperative covers hypothetical, but possible situations. Yurakaré, which classifies all imperatives as irrealis, seems to be sensitive to the fact that the events are unrealized at the moment of speech, regardless of speaker commitment.

4.3 Negatives

Yurakaré does not include negative statements into the category of irrealis, but other languages do. One language that has been mentioned before, Caddo, marks all negative statements as irrealis:

(24) *kúyt'áybah*
kúy-t'a-yi.bahw
NEG-1AG.IRR-see
'I don't see him.'

It has already been argued by Mithun (1995) that cross-linguistic differences between languages with regard to the reality status of negatives are not so much due to the hybrid status of negation, but rather to differences in scope. She claims (ibid.: 380–382) that the difference between Central Pomo (which does not classify negatives within the irrealis category) and Caddo is the following:

(25) Central Pomo negatives *negation (±realis (proposition))*
Caddo negatives *– realis (negation (proposition))*

The situation in Yurakaré is similar to Central Pomo. Consider the following examples of emphatic predicate repetition:

(26) a. *nish tiya-m ushta tiya-m=ja*
NEG eat-2SG.S before eat-2SG.S=SS
'You did not eat it before!'

b. *nish yarru ma-ense-tijti ma-ense=ya*[15]
NEG chichi 3PL-drink-1PL.HAB 3PL-drink=NE
'We haven't been drinking chicha all this time.'

Whether a proposition is classified as realis, as in (26a), or as irrealis, as in (26b), is determined by the TAM information on the verb; whether the predicate is negated or not does not have any influence on the realis-irrealis distinction. Further evidence that reality status in Yurakaré only applies to the predicate is the fact that in the emphatic predicate repetition construction, only the predicate is repeated, not the negator.

Even though we consider Mithun's analysis perfectly possible, we would like to point out that there is an alternative analysis which is in fact opposed to the one given in (25). The Caddo example in (24) can have two possible analyses, with different scope relations for the negative:

(27) a. [it is not the case that [proposition]]
b. [it is the case that [not proposition]]

15. The suffix *-tijti* is an irregular merger of the habitual marker *-jti* with the first person plural subject *-tu*.

If we adopted the option given in (27a), we could say that the proposition is irrealis because it is governed by the negation, like in example (28a) from Spanish:

(28) a. *no es verdad que [sea así]*
NEG be.3SG.IND true that be.SBJ like.that
'It is not true that it is like that.'

b. *es verdad que [no es así]*
be.3SG.IND true that NEG be.IND like.that
'It is true that it is not like that.'

Taking this into account, Mithun's analysis of the scope relations in Caddo might also be reversed, which would reflect the morpheme order:

(29) a. [negation [(–realis) proposition]]
b. [kúy- [t'a-yi.bahw]]

Similarly, we might imagine that negation in Yurakaré (and Central Pomo) falls inside the scope of reality status. In this case, negative statements can, but need not be descriptions of reality:

(30) a. I do not see him (realis)
b. I could/will/must/etc not see him (irrealis)

This then would lead to the following alternative to (25):

(31) Central Pomo negatives ± *realis (negation (predicate))*
Caddo negatives *negation (– realis (predicate))*

We are not claiming that this analysis should be chosen over Mithun's, we are merely indicating a conceivable alternative analysis, based on the idea that negation can operate on different levels. To determine which analysis describes the facts of a language better, detailed language-internal research is necessary.

The possibility of the analysis in (31) is supported by Terêna (southern Arawak, Brazil). In this language, there are two negators: *ako* for negative actual (or realis in our terms) and *hyoko* for negative potential (or irrealis). When negated, the mood value of the verb is reversed, i.e. *ako* occurs with irrealis forms, rendering a realis meaning, whereas *hyoko* occurs with realis forms, rendering an irrealis meaning (Ekdahl & Grimes 1964: 268):

(32) a. *pih-óp-o*
go-DIR-REA
'He went to where he came from.'

b. *hyoko pih-ép-o*
NEG.IRR go-DIR-REA
'Do not go where you came from.'

(33) a. *pih-ép-a*
go-DIR-IRR
'Go back to where you came from.'

b. *ako* *pih-áp-a*
NEG.REA go-DIR-IRR
'He did not go where he came from.'

Terêna seems to represent neither of the scope possibilities given in (25) or (31). It rather seems to represent a combination of the two possibilities given in (31). Examples (32b) and (33b) can respectively be paraphrased as (34a) and (34b):

(34) a. His actual going is untrue in a potential world (desired by the speaker)
b. His potential going is untrue in the actual world

This then corresponds to a double marking of reality status when dealing with negatives in Terêna, with different scopes:

(35) a. [−REA [NEG [+REA [event]]]]
b. [+REA [NEG [−REA [event]]]]

In this system, the negator, in combination with its reality status, governs the reality status of the predicate. This, in combination with (31) would give us three possibilities:

1. Negation has scope over reality status, determining an irrealis status for every utterance (Caddo)
2. Reality status has scope over negation, negated statements can be either realis or irrealis, depending on the TAM category they are marked for (Central Pomo, Yurakaré)
3. Reality status has scope over negation, but negation has scope over another layer for which reality status has to be determined, leading to negative realis statements for potential worlds, and negative irrealis statements for actual worlds (Terêna)

However, before we can be certain about any of the interpretations, more in-depth accounts of these constructions are needed for each language. The problem with negation is that it can function on at least three different levels (Van Valin & LaPolla 1997: 45–46): on the nuclear level (constituent negation) like English *un-* in *unhappy*, on the core level (narrow-scope or internal negation), and on the propositional level (clausal or external negation). Language-specific tests, of the type given by Payne (1985: 198) for English, are necessary to distinguish between these different types of negation (see also Lyons (1977: 768–777) for a discussion on the interaction of (the level of) negation and modality). Nevertheless, the general

point made by Mithun (1995), that scope relations interfere with cross-linguistic differences in classifying negation as irrealis or not, remains unaltered.

4.4 Habitual

In some languages, like in Yurakaré, the habitual is also part of the irrealis category. Evans (2003: 371) mentions that in the eastern dialects of Bininj Gun-Wok, Kuninjku and Kune, there is no special marker for imperfective aspect. These dialects resort to a number of strategies to fill this 'gap', one of them being the extension of the irrealis marker to cover habitual past actions (ibid.: 372):

(36) *yarlang ya yarlang birri-name-ninj birri-borrkke-meninj*
ordinary yeah ordinary 3AUG.P-make-IRR 3AUG.P-dance-IRR
bungkurl-kah birri-borrkke-meninj o djal kun.borrk-kah
[style]-LOC 3AUG.P-dance-IRR or just [style]-LOC
birri-borrkke-meninj
3AUG.P-dance-IRR
'Ordinary ones (body decorations) yeah, they'd put it on and dance in the bunkurl style or in the kun-borrk style.'

Possibly, the extension of irrealis to just past habitual and not present habitual has to do with the fact that with past habitual, the generic situation is not a description of current reality. Therefore it is compatible with the counterfactual nature of irrealis in Bininj Gun-Wok.

In Bargam, a non-Austronesian language of the Trans-Guinea phylum (Hepner 1995), we find another interesting connection between the habitual and the irrealis. The realis/irrealis distinction is marked on the medial clause, depending on the TAM marking of the final clause, somewhat like in Yurakaré. The following possibilities are attested:

Table 3. Medial/final clause combinations in Bargam

final clause	*medial clause*
present	realis
past perfective	realis
past imperfective	realis or irrealis
future	irrealis
imperative	irrealis
desiderative	irrealis
counterfactual	irrealis

As appears from Table 3, present and past perfective are realis categories; future, imperative, desiderative and counterfactual are irrealis categories. The category of interest here is the past imperfective, which can either co-occur with realis or irrealis marking on the medial clause. An imperfective past with realis (default) marking in the medial clause expresses enduring situations (static verbs: continuous state, motion verbs: progressive, single action verbs: iterative) which are part of the event line of a narrative. With irrealis marking in the medial clause, background information is encoded; the event is not part of the event line of a story and serves as background information. Hepner (ibid.: 20) notes that this latter use corresponds to what Givón (1984: 285) calls 'habitual', because it is on the one hand asserted, but on the other hand non-referential, which gives it an irrealis component.

Bargam is often quoted as a language that includes the habitual into the irrealis category (e.g. Roberts 1990). As we have seen, the situation is more complex than that: the combination of the past imperfective in the final clause with irrealis in the medial clause yields a habitual interpretation. This shows a connection between habitual and irrealis, but not that the habitual can be classified an irrealis category. In Yurakaré, the habitual in the final clause always triggers irrealis marking in the medial clause, so this is a true example of a language that includes the habitual in the irrealis category.

A number of authors have commented on the connection between irrealis mood and habitual: We have already mentioned Givón's (1994: 270) observation that both habitual and irrealis are temporally non-specific and can have non-referring arguments, and Comrie's claim that both involve statements about possible worlds (Comrie 1985: 40, also mentioned by Chung & Timberlake 1985: 221). There are other authors who have found other correlations, mainly between irrealis and the imperfective aspect, of which the habitual is a subcategory. James (1982: 399) mentions that both irrealis and imperfective are not (fully) realized at the time of reference. A strong version of this seems to be responsible for the extension of irrealis to past habitual in Bininj Gun-Wok. Another similarity is the discourse-based connection between background information, imperfective aspect and irrealis (Fleischman 1995: 539–542). Imperfective in narratives is often associated with background information, which has a reduced degree of assertiveness and therefore is connected to irrealis in many languages. As an example, we have seen that this plays an important role in Bargam discourse. Furthermore, the backgrounding-imperfective-irrealis connection has to do with anchoring in time: backgrounded events are not part of the time line of a story, and are therefore temporally less specific. Summarizing, even though the habitual at first sight seems to be a clear-cut realis category, it has a number of characteristics associated with irrealis as well. This explains the fact that some languages classify the habitual as an irrealis category.

5. Analysis

We would like to argue that irrealis is a cross-linguistically useful category, but it is multi-facetted, i.e. it does not refer to a binary distinction between real and unreal events, but rather to a continuum of distinct but interrelated aspects. Following, among others, Givón (1982) and Akatsuka (1985) we propose a gradient difference between counterfactual on the one hand, and factual on the other, with a domain in the middle that we can call 'possible', as schematized in Figure 1:

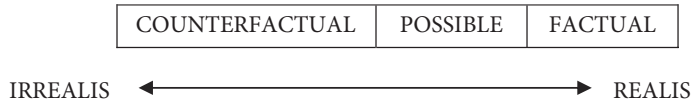


Figure 1. The semantic domain of irrealis

Languages make different choices as to where they put the boundary between realis and irrealis. We argue that these different choices do not happen randomly, but rather show a regular pattern.

In Bininj Gun-Wok, the category of irrealis seems to be mainly confined to the counterfactual domain.[16] As indicated in Figure 2, in Amele irrealis extends to the 'possible' domain as well:

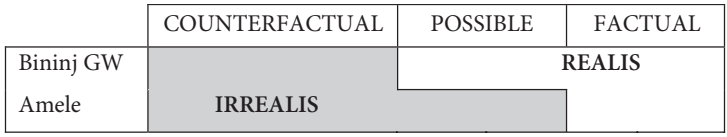


Figure 2. Irrealis in Bininj Gun-Wok and Amele

The domain of possible events can be subdivided into events involving speaker commitment and events involving a lack of speaker commitment. Languages that are sensitive to this distinction place the boundary between realis and irrealis within the domain of possible events, as indicated in Figure 3 below. They can do so in different ways. For instance, future tense in Central Pomo and imperatives in Alamblak can be either realis or irrealis. In Caddo, both future and imperatives are realis, whereas other categories connected to possibility fall under the irrealis category. This leads to an analysis in terms of an implicational hierarchy as presented in Figure 3.

16. It seems that the irrealis in Bininj Gun-Wok has extended to include some possible events.

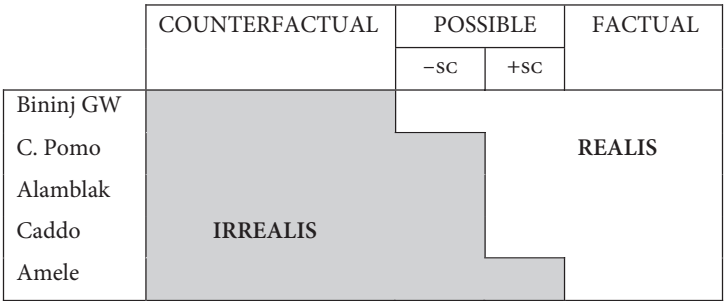


Figure 3. Irrealis in Bininj Gun-Wok, Central Pomo, Alamblak, Caddo and Amele

Yurakaré and Bargam include the habitual into the irrealis category. As mentioned, Givón (1994) considers the habitual to be of hybrid modality, combining realis features (actual occurrence) with irrealis features (non-referential and temporally unspecific). We propose that the domain of factual events can also be subdivided temporal and atemporal events. Yurakaré and Bargam then extend the irrealis category to include atemporal factual events (see Figure 4):

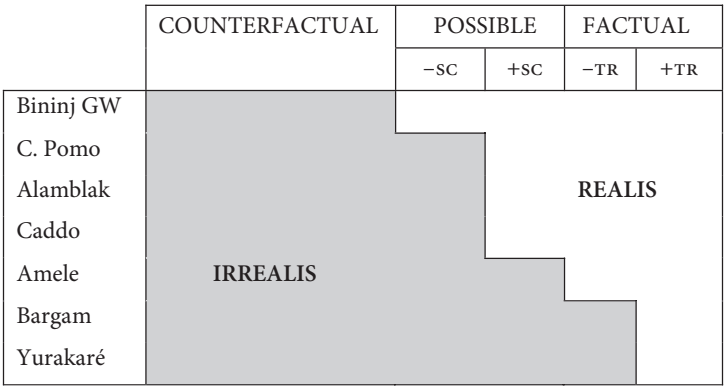


Figure 4. Irrealis in Bininj Gun-Wok, Central Pomo, Alamblak, Caddo, Amele, Bargam and Yurakaré

Possibly the 'temporality' dimension can be seen as a subdomain of referentiality in general, other subdomains being participant reference, place reference (as observed by Givón 1994) and possibly aspectual (i.e. internal structure) reference, the latter relating to the connection between imperfective aspect and irrealis discussed by Fleischman (1995). Future research will have to point out the exact relationship between referentiality and irrealis.

The data discussed so far seem to suggest that languages make different choices as to where to put the boundary between realis and irrealis, but that the way in

which languages differ from each other is constrained. Irrealis minimally includes counterfactual events; if it contains possible events, it will also contain counterfactual events; within the category of possible events, languages may also draw a boundary between [–speaker commitment] and [+speaker commitment] events. Inclusion of the latter into the irrealis category implies inclusion of the former; if a language includes habituals, it will also include possible and counterfactual events. However, a number of points warrant further discussion.

At first sight, Yimas seems to be an exception to the implicational hierarchy we proposed: it marks atemporal events for irrealis, but counterfactuals, a number of possible events and the habitual are not marked for irrealis, which constitutes a violation of the hierarchy. Foley (1991: 251) states that "within the irrealis dimension, languages often recognize further distinctions, whether the action is necessary, likely, or merely possible. Yimas is one of these languages, and these *additional* modal distinctions are provided by a set of modal prefixes" (our emphasis). It is not clear what Foley means by 'additional'. If he means that the function of the irrealis marker extends to all counterfactual and possible events, and speakers simply have a choice between a more specific modal marker and the irrealis marker, then Yimas would fit in our semantic domain. If, on the other hand, Foley refers to some predefined notion of irrealis, which in Yimas is covered by the irrealis marker plus the modal suffixes, it does not fit in. If this is the case, the term 'irrealis' may be infelicitous as a gloss, because it covers only one of a set of irrealis markers. If the latter analysis of the Yimas irrealis category prove to be valid, then Yimas genuinely constitutes a counterexample and the semantic domain we propose in Figure 1 does not represent a hierarchy and needs to be adapted.

Another point is the role of the habitual. As mentioned, some dialects of Bininj Gun-Wok extend the use of the irrealis marker to habitual contexts. Nevertheless, we claimed that only counterfactual events are included into the domain of irrealis, possibly with some spill-over to possible events. This would constitute a violation of the connectivity hypothesis for semantic maps, which says that "any relevant language-specific and/or construction-specific category should map onto a *connected region* in conceptual space" (Croft 2003: 134). However, the Bininj Gun-Wok dialects mark only past habituals as irrealis, indicating events that are no longer true and will not be true in the future either. This contrasts with the habitual category of Yurakaré, which covers both a past and present habitual interpretation.

Finally, negation poses a problem. In some languages, like Caddo, negation is necessarily irrealis, whereas in other languages, like Yurakaré or Central Pomo, it has no influence on reality status. This has to do with scope relations. We have seen that in principle two alternative analyses are possible. In Mithun's (1995) analysis, negation is an irrealis category, and in languages that do not classify all negated

clauses as irrealis, negation is simply outside the scope of reality status. In our alternative analysis, negation is in itself not an irrealis category, but triggers irrealis marking when it has scope over the whole proposition, like in Caddo.

6. Conclusion

We have argued that the category of irrealis, in spite of many cross-linguistic differences, is consistent across languages in that it follows the following implicational hierarchy:

(37) counterfactual < possible [– spkr commitment] < possible [+ spkr commitment] < factual [–temp specific] < factual [+temp specific]

We are aware that the observations made in this paper are only tentative, and that many more languages should be taken into consideration to validate the claims that we make, but we do think that this paper can serve as a starting point for future research aimed at cross-linguistic comparison of the irrealis category.

Abbreviations used

AFO	affected object	DSC	discourse	LIM	limitative
AG	agent	F	feminine	LOC	locative
APPL	applicative	FR	far	MID	middle voice
ASP	aspect	FUT	future	MOD	modality
AUG	augmented	HAB	habitual	MOM	momentaneous
CAU	causative	HOR	hortative	NB	notable information
CL	class	IGN	ignorative	NE	non-experienced
CO	co-operative object	IMP	imperative	NEG	negation
COP	copula	INC	incompletive	NR	near
DE	different event	IND	indicative	OBJ	object
DEL	delimiter	INTJ	interjection	OBL	obligative
DEM	demonstrative	INTL	intentional	P	past
DEP	dependent	INTS	intensifier	PL	plural
DER	derivation	IO	indirect object	POT	potential
DES	desiderative	IPF	imperfective	PRF	perfective
DIR	directional	IRR	irrealis	PRN	pronoun
DS	different subject	JUS	jussive	PROH	prohibitive
PRS	personal	SBJ	Subjunctive	SS	same subject

PS	possessive	SC	speaker commitment	TAM	tense-aspect-mood
REA	realis	SE	same event	TR	temporal reference
REM	remote	SG	singular	VAL	validational
S	subject	SIM	simultaneous		

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On the selection of mood in complement clauses*

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In this paper, the selection of indicative or subjunctive for complement clauses in Romance languages is considered, the proposal being made that the selection of one or another mood is related to the kind of attitude expressed by the main predicate. Specifically, indicative is selected when the expressed attitude is one of knowledge or belief, otherwise subjunctive being selected. Hence, a relation is established between epistemic or doxastic modality and the selection of indicative, while subjunctive is not linked to any particular kind of modal value.

1. Introduction

In this paper, the distribution of the indicative and the subjunctive in complement clauses in Romance languages will be considered, with the purpose of shedding some light on the principles underlying mood selection. Though a large amount of work has been devoted to this subject, some facts concerning mood selection in Romance languages are left unexplained by the available analyses. Such facts mainly concern the selection of mood in complement clauses, on which this paper will focus.

In Section 2, the parametric variation among Romance languages concerning mood selection in complement clauses will be presented. Section 3 describes the main semantic and pragmatic approaches to mood selection, pointing to facts that are problematic for each of them. In Section 4 the proposal will be explored that the selection of mood is dependent on the kind of attitude that the main predicate expresses.

*I am grateful to the organizers of the Workshop *TAM TAM*: *Cross-linguistic semantics of Tense, Aspect, and Modality* for financial support and to the participants at the workshop for helpful comments. My thanks also to the organizers of this volume and the reviewers for their very helpful feedback.

2. Parametric variation on mood selection within Romance languages

Within the family of Romance languages, two groups have been identified regarding the selection of the subjunctive or the indicative for complement clauses. One of these groups is constituted by Catalan, French, Italian, Portuguese and Spanish. The other one is formed by Rumanian, which follows the pattern found in other European languages, such as (Modern) Greek, Hungarian and some Slavic languages. These differences mainly regard the selection of mood in the complement clauses of a subclass of factive verbs.[1] In Rumanian, all factive predicates are indicative governors, while in the other Romance languages a split arises in the group of factive predicates. Some of them, such as the equivalents of *astonish, find strange, like, regret, deplore, forgive*, among others, select the subjunctive, contrary to other factive verbs, such as the equivalents of *know, verify*, and others, which are indicative governors:

(1) a. *a Maria lamenta que o Paulo tenha*-SUBJ *saído* [Portuguese]
b. *Maria regretă că Paul a*-IND *plecat* [Rumanian]
'Maria regrets that Paul hás left.'

(2) a. *a Maria sabe que o paulo está*-IND *doente* [Portuguese]
b. *Maria ştie că Paul a*-IND *plecat* [Rumanian]
'Maria knows that Paul has left.'

As for the selection of mood by non-factive predicates, in all Romance languages, most of them (e.g., the equivalents of *want*, *forbid*, *order*, *to be possible/necessary* and many others) are subjunctive governors, while the indicative is selected by predicates of the following classes:

(3) a. declarative predicates; e.g., *say*, *report* …
b. fiction verbs (a term I borrow from Farkas 1992); e.g., *dream, imagine* …
c. commissive predicates; e.g., *promise, swear* …
d. predicates expressing certainty; e.g., *be sure*, *infer* …

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1. In the definition of factive verb, I follow Karttunen (1971), assuming that factive verbs are those that trigger the presupposition that their complement clause is true; a property that can be stated as follows (where *V* stands for the factive verb and *p* for the complement proposition):

(i) $[V(p) \Rightarrow p \wedge \neg V(p) \Rightarrow p]$

Thus, *find out*, *discover, know*, *regret*, and many others, are factive verbs, while *see*, *manage*, *avoid*, and others are examples of non-factive verbs.

The distinction between 'factive' and 'non-factive' is also operative in adjectives and nouns of sentential complementation. For instance, *to be pleased, to be a pity* are factive predicates, and *to be sure/hard* … are non-factive predicates.

The final group of predicates to be taken into consideration is formed by those which allow both moods to occur in their complement clauses, a class which includes epistemic predicates such as the equivalents of *believe*. In Italian, the equivalent of this verb – *credere* – preferably selects the subjunctive, while in the other Romance languages it preferably selects the indicative:

(4) *acredito* *que* *está* *doente* [Portuguese]
believe(1SG) that is(3SG-IND) ill

(5) *credo* *che* *sai* *malato* [Italian]
believe(1SG) that is(3SG-SUBJ) ill
'I believe he is ill'

Leaving aside, for the moment, this last difference, the two groups of Romance languages that are identified fit on the typological classification of Noonan, which Hengeveld (2004) also assumes. According to these authors, three types of languages are identified concerning the indicative/subjunctive opposition in complement clauses.

In the languages of the first group (which, according to Noonan, include Lori, a language of Iran, and Bulgarian), the subjunctive is selected in those cases where the time reference of the complement clause is determined by the main predicate. For instance, complement clauses of the verb *to force* exhibit the subjunctive because the time reference of the event described by the complement clause can not be anterior to the time reference of the main predicate, while predicates like *think*, *doubt* and others select the indicative because the reference time of the complement clause is independent of the time reference of the main clause. To illustrate, consider the following examples, from Lori, provided by Noonan:

(6) *Zine* *pia-ye* *vadašt* *ke* *tile-ye* *bedoze*
woman man-OBJ forced(3SG) COMP chicken-OBJ steal(3SG SUBJ)
'The woman forced the man to steal the chicken.'

(7) *Zine* *fekr* *i-kone* *ke* *pia* *tile-ye* *dozi*
woman thought PROG-do(3SG) COMP man chicken-OBJ stole(3SG IND)
'The woman thinks that the man stole the chicken.'

In the second group of languages (e.g., Russian or Persian, according to Noonan 1985), the subjunctive is selected for those complement clauses "which contain the description of an event the factuality of which has not been determined" (Hengeveld 2004: 1201). For instance, predicates like *doubt*, *want*, *be necessary*, among others, are subjunctive rulers, but not predicates like *say*, *think* or *regret*, as shown by the following examples from Russian, provided by Noonan:

(8) *ja somnebajus'*, *čtoby* *Boris* *prišël*
I doubt COMP Boris come
'I doubt that Boris will come.'

(9) *ja ljublu, čto Boris pridët*
I like COMP Boris will come
'I like it that Boris will come.'

Finally, in the third group of languages (both Noonan and Hengeveld refer to Spanish as a member of this group), the subjunctive is selected not only for the same contexts as in the languages of the second group, but also for those complement clauses whose proposition belongs to the common ground. Thus, the complement clause of verbs like *regret* exhibit the subjunctive (cf. (10)), the reason for this, according to the mentioned authors, is that the complement proposition is taken to be known prior to utterance:

(10) *lamento que Juan salga esta noche*
regret(1SG) COMP Juan leave(3SG SUBJ) this night
'I regret that Juan will leave tonight.'

According to this typological classification, Rumanian will be a language of the second group, given that the subjunctive complement clauses do not describe reality, while the other Romance languages belong to the third group, given that some factive verbs are subjunctive rulers. In the following section, a more detailed description of the last two factors that Noonan and Hengeveld assume to be operative in the selection of the subjunctive for complement clauses will be taken into consideration. As for time reference dependency, I will have nothing to say about it, except that in Romance languages this factor does not seem to be an issue that, just by itself, leads to the selection of the subjunctive. In fact, though some verbs that impose restrictions on the temporal interpretation of their complement clause select the subjunctive (e.g., *order*, *force*, …), others select the indicative (e.g., *promise*, *swear*, and other commissive verbs).

3. Approaches to mood selection

3.1 Mood selection and truth value

Traditional grammars of different Romance languages associate the indicative/subjunctive opposition with the *realis/irrealis* distinction, the subjunctive being the mood used in contexts expressing irreality or virtuality, and the indicative the default mood. If only main clauses are taken into consideration, this approach accounts for the fact that the indicative is the mood selected in declarative sentences, used to describe reality, while the subjunctive may only occur in imperative sentences or clauses expressing desire, suggestion, or doubt, as shown by the following examples of Portuguese:

(11) a. *Saiam*!
leave-SUBJ
'(You) leave!'

b. *Oxalá chovesse*!
God-wishes rain-SUBJ
'I wish it would rain!'

c. *Talvez chova*!
may be rain-SUBJ
'Maybe it rains!'

However, if subordinated clauses are taken into consideration, the evidence becomes clear that the association of the indicative/subjunctive opposition with the *realis/irrealis* distinction gives an account of only some of the facts.

In effect, taking into consideration adverbial clauses, there are cases where the subjunctive is selected for sentences taken to be true, such as concessive clauses, as (12), and the indicative for sentences not expressing reality, such as the consequent of some conditionals, as (13):

(12) *embora estivesse a chover, o dia estava agradável*
although was-SUBJ at to-rain, the day was pleasant
'Although it was raining, the day was pleasant.'

(13) *se eu tiver oportunidade, falo com a Ana*
if I have opportunity, talk-IND with the Ana
'If I have the opportunity, I will talk to Ana.'

Likewise, in all Romance languages, the indicative is selected by some verbs whose complement is not taken to describe reality, such as *dream* or *imagine* (cf. (14)), as observed by Farkas (1992), and, in all the Romance languages with the exception of Rumanian, the subjunctive is selected by a sub-group of factive verbs, of which *regret* is an example (cf. (15)):

(14) *imaginemos que estamos no século XVI*
imagine that are-IND in-the century XVI
'Let us imagine that we are in the XVIth century.'

(15) *lamento que a proposta tenha sido recusada*
regret that the proposal has-SUBJ been refused
'I regret that the proposal has been refused.'

Moreover, in French, the subjunctive is found in the complement clause of the equivalent of the noun *fact*, though it clearly is not associated with some irreality value:

(16) *le fait qu'il soit parti ne peut être oublié*
the fact that-he has-SUBJ gone not may be forgotten
'The fact that he left may not be forgotten.'

Apart from these problematic cases, the intuition that the indicative is selected for sentences taken to be true, and the subjunctive is the mood of irreality, accounts for the selection of mood in the Romance languages. In fact, several verbs that allow the inference that their complement clause is true (e.g., *know*) select the indicative, while verbs that allow the inference that their complement proposition is false (e.g., *prevent*) or that do not allow the inference that their complement clause is true (e.g., *want*) select the subjunctive.

A similar kind of intuition is explored by several authors (cf. Solano-Araya 1982; Palmer 1986; Bell 1990, among others), which relate the selection of the indicative or the subjunctive with the degree of belief being expressed. According to Palmer:

> The indicative is used where the subject shows some positive degree of commitment to the proposition, either total as with *assert*, or partial as with *think*. Where there is no degree of positive commitment but either non-commitment as with *be possible*, or negative commitment as with *doubt* (partial negative commitment) or *don't think* (total negative commitment), the subjunctive is used. (Palmer 1986: 145)

This kind of approach faces the same problems as the one that bases the indicative/subjunctive distinction with the *realis*/*irrealis* opposition, namely, on one side, the selection of the indicative by verbs as *dream* and, on the other side, the selection of the subjunctive for concessive clauses, for complement clauses of the noun *fact* (in French), and for complement clauses of some factive verbs.

The first of these problems is tackled by Farkas (1992), who makes a distinction between *extensional* and *intensional predicates*:

> […] crucial to the choice between the indicative and the subjunctive is whether the proposition is interpreted with respect to a particular world or whether it is interpreted with respect to a set of worlds; the former type of relation will be called extensional anchoring, and the latter, intensional anchoring. (Farkas 1992: 85)

Roughly, her proposal is that verbs like *dream* introduce a single possible world where the complement clause is taken to be true, just like predicates such as *know* or *believe* indicate that their complement clause is true in the world that models reality or anybody's version of it. Therefore, these are extensional predicates, in Farkas terms, and, thus, select the indicative. On the other hand, modals, desideratives and directives are intensional anchoring predicates and select the subjunctive.

The same idea is explored by Giannakidou (1994), who replaces the concepts of *extensional* and *intensional anchoring* by the terms *veridicality* and *nonveridicality*, respectively, showing that, in Modern Greek, the subjunctive is selected for nonveridical contexts. A more detailed exposition of the concept of *veridicality* is provided by Giannakidou (1999). This concept was introduced by Montague (1969) "in order to characterize the semantics of perception verbs like *see* which

entail the existence of the individuals involved in their complement […] if I see a student running, I also see a student, therefore a student exists, *see* is veridical" (Giannakidou 1999: 384). Other authors have explored the concept of *veridicality* (e.g., Valencia et al. 1993; Zwarts 1995, among others), assuming that a propositional operator is veridical with respect to its *nth* argument if it entails the truth of it. For instance, *although* is a veridical operator, since (17a) entails (17b), while *perhaps* is a nonveridical operator, since (18a) does not imply (18b):

(17) a. Although it was Sunday, John was working hard.
b. John was working hard

(18) a. Perhaps somebody closed the door.
b. Somebody closed the door.

On the basis of this concept of *veridicality*, predicates like *see*, *manage*, *start*, and *be glad* are veridical, but predicates like *believe* are nonveridical. Giannakidou (1999) defines the concept of *relativized* (*non*)*veridicality*, according to which veridical propositional operators are those which allow the inference that the proposition is taken to be true by some individual. The formal definition runs along the following lines:

(19) DEFINITION of Relativized (non)veridicality:
Let c = <cg(c), W(c), M, s, h, w0, f, …> be a context.
(i) A propositional operator *Op* is *veridical* iff it holds that
$[[Op\ p]]_c = 1 \rightarrow [[p]] = 1$ in some epistemic model $M(x) \in c$; otherwise
Op is nonveridical (cf. Giannakidou 1999: 388)

This definition relies on the concept of "epistemic model", which she defines as a set of worlds associated with an individual's belief state; i.e., the worlds compatible with, e.g., what an individual believes, dreams or imagines (cf. Giannakidou 1999: 386–387). The crucial point is that, according to this notion of relativized (non)veridicality, veridical verbs are those that allow the inference that their complement clause is true in a model associated with the individual standing for the matrix subject, though not necessarily in the world modeling reality. Thus, predicates like *to believe* or *to dream* are veridical, since they allow the inference that their complement clause is true in a model representing the main subject's beliefs or dreams. Naturally, factive predicates are veridical as well, since their complement proposition is true in some epistemic model (the one representing the speaker's beliefs and the one representing the main clause subject's beliefs, as in the case of *Mary knows that it is raining*, or the one representing the speaker's beliefs, as in *Mary doesn't know that it is raining*). On the contrary, predicates like *to want* or *to ask* are nonveridical, since they do not allow the inference that their complement clause is true in some epistemic model.

This concept of relativized (non)veridicality solves one of the problems mentioned above: the selection of the indicative by verbs that do not commit anybody to the truth of the proposition in the real world, such as *dream*. According to the above definition, such verbs are veridical, since they allow the inference that their complement clause is true in an epistemic model, the one representing the main subject's dreams. Thus, in the analysis of mood selection, Giannakidou's concept of veridicality has a greater descriptive power than the one of *irreality*.

The proposal that the subjunctive is selected for nonveridical contexts accounts for the distribution of the subjunctive in Modern Greek, as Giannakidou shows. However, a proposal along these terms fails to explain data of most Romance languages, where the subjunctive is selected by some factive predicates, which are veridical predicates, as seen above.

3.2 Mood selection and speech acts

A different approach to the indicative/subjunctive opposition, advocated in Klein (1975) and (1990), Hooper (1975), Bybee and Terrell (1990), among others, explores the intuition that mood choice is related to speech acts. Such a line has been pursued mainly on the basis of Spanish data, where, like in other Romance languages, the subjunctive occurs in complement clauses of factive predicates like *regret*, *be odd/strange*, among others.

The basic common idea to such proposals is that the choice for the indicative is related to *assertion*, while the subjunctive is the mood used in non assertive speech acts. Like the kind of approaches previously considered, this line of reasoning explains the selection of the indicative in declarative sentences and the selection of the subjunctive in other independent clauses, such as (11a–c), above. As for complement clauses, the assertion/non-assertion approach explains naturally the selection of the indicative by declarative predicates, since they express an assertive speech act, and the selection of the subjunctive by predicates associated with the expression of other kinds of speech acts, such as desideratives and directives.

On the basis of the idea that the indicative is the mood used in assertions and the subjunctive the mood of non assertion, Hooper (1975) proposes the following classic classification of predicates:[2]

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2. In addition to the fact that, both in Spanish as in other Romance languages, assertive predicates are indicative governors and non-assertive ones are subjunctive governors, some syntactic facts have been pointed out that distinguish the assertive from non-assertive predicates, such as complement preposing:

(i) she is ill, I suppose/they said/*it's probable/*it's strange.

Table 1. Hooper's classification of predicates

Assertives	Non-factives	*think, believe, say, agree*
	Semi-factives	*find out, discover, know*
Non-assertives	Non-factives	*be likely/possible/probable*
	Factives	*regret, resent, be odd/strange*

One point of criticism to the proposal that the indicative is the mood of assertion is that, as Palmer (1986) observes, it doesn't explain the selection of the indicative in interrogatives, which do not express an assertive speech act. Moreover, as has been stressed by several authors, the proposal that the indicative is selected by assertive predicates and the subjunctive by non-assertive ones lacks a precise definition of 'assertive' in order to be operative. For instance, as Palmer points out, "In what sense does THINK assert, while the negative of SAY does not? Both express some kind of opinion about a proposition, but neither asserts that it is true." (pp. 142–143).

One answer to this problem that has been explored in the literature (cf., Noonan 1985; Palmer 1988, among others) is that the assertive predicates express a commitment of the main subject with the truth of the complement proposition. This feature unifies the assertive predicates, but raises the problem of explaining the selection of the subjunctive by factive predicates like *regret*, which express the same commitment.

Concerning these predicates, the claim has been made that their complement proposition is not asserted, but assumed to be known prior to the utterance:

> Complements of commentative predicates like regret are discourse dependent because in saying sentences like (252) [I regret that John will leave tonight], one must assume (if one is being sincere) that the hearer already knows the information in the complement. This information is the common ground or background to the discourse and the function of the sentence is to comment on this information. (Noonan 1985: 99)

Pushing this line of argumentation, that relays on the traditional difference between 'assertion' and 'presupposition', the proposal can be made that Hooper's non assertive predicates are not able to add new information to the common ground, either because their complement clause is not taken to be true, and, thus, is not a candidate to update the common ground, or because it already belongs to the context of conversation.

However, this line of reasoning does not seem to be tenable. In fact, even if non assertive predicates are not able to add their complement proposition to the common ground, it still has to be shown that assertive predicates have this capability. Such position is hardly defensible, for at least two reasons. In the first place, the complement proposition of Hooper's assertive non-factive predicates is not

necessarily added to the common ground, since they don't express a commitment of the speaker towards the complement proposition. For instance, sentence (20) can be felicitously asserted in a context where the participants on the conversation know that Mary is not sick:

(20) John thinks that Mary is sick.

In the second place, the complement proposition of Hooper's semi-factive predicates can be part of the common ground prior to their assertion, as shown for instance, by (21):

(21) John knows/will never find out that we are here.

Moreover, the hypothesis that the complement proposition of non-assertive predicates is not added to the common ground, though plausible at first sight, is not confirmed when subjunctive governors like *allow*, *permit*, *be enough* or *not avoid* are taken into consideration. As shown by the following examples, extracted from Portuguese newspapers,[3] the complement clause of such (non assertive, according to Hooper's classification) predicates might be presented as new information:

(22) *a intervenção da polícia* […]***não impediu*** *que, uma hora*
the intervention of-the Police not prevent that, one hour
mais tarde, voltassem a ocorrer incidentes
more late, turn-SUBJ to occur incidents
'The intervention of the Police did not prevent that, one hour later, new incidents took place.'

(23) *o general M. Milovanovic,* […], ***permitiu*** *que a operação*
the general M. M. allowed that the operation
fosse desencadeada, acrescentou o porta-voz do ACNUR
was-SUBJ started, added the spokesman of-the ACNUR
'The general M. M. allowed the operation to take place, the spokesman of ACNUR added.'

(24) *Carlos Narciso* ***fez*** ***com que*** *os factos falassem por si*
Carlos Narciso made that the facts spoke-SUBJ for themselves
'Carlos Narciso made the facts speak for themselves'

(25) *uma audiência reduzida e seleccionada,* […], ***deixou*** *que*
an audience reduced and selected allowed that
fossem retirados mais objectos do que os negociados
were-SUBJ withdrawn more objects of-the what those negotiated
'A reduced and selected audience permitted that more objects than had been negotiated were withdrawn.'

3. The examples are available at http://www.linguateca.pt/.

Thus, the reason for the selection of the indicative by Hooper's assertive predicates and the selection of the subjunctive by non assertive predicates is not due to the capability of adding new information to the common ground.

A different approach to the link between the selection of mood and the concept of assertion is explored by Panzeri (2003), who relates the assertibility feature that indicative governors would have to Stalnaker's (1979) perspective on conversation. Roughly, she claims that, as expressed in (26), a complement clause in the indicative is able to provide a change in the input context, this input context being indicated by the lexical entry of the matrix predicate, while complement clauses in the subjunctive mood are not able to provide this changing operation:

(26) If ϕ is in the indicative mood, ϕ counts as assertible.
If ϕ is in the subjunctive mood, ϕ counts as non-assertible.
ϕ is assertible wrt an input context c' iff c' + ϕ ≠ c' and c' + ϕ ≠ ∅.
ϕ is non-assertible wrt an input context c' iff c' + ϕ = c' or c' + ϕ = ∅.
(Panzeri 2003: 218)

To exemplify, according to Panzeri's proposal, modal predicates are subjunctive governors for the following reason:

> Traditionally, Modal predicates like "it is possible that ϕ" and "it is necessary that ϕ" are analyzed as claiming that ϕ is true in, respectively, at least one world or in all worlds within a contextually determined modal base. […] once we have individuated the appropriate (epistemic, deontic, …) modal base, we must check whether the dependent proposition "it is raining" is true in at least one or in all worlds of that context. And this "purely" checking operation becomes formally translated as: there is a world w' within the modal base such that: {w'} + "it is raining" = {w'}, in the case of "it is possible"; and: for all worlds w' within the modal base: {w'} + "it is raining" = {w'}, in the case of "it is necessary". This means that the subordinate proposition "it is raining" counts as non-assertible with respect to its input context (the singleton {w'}), since its contribution is only to check whether the modal base meet the requirements established by the Modal predicates. (*ib.*: 219)

Concerning epistemic verbs like *think*, Panzeri claims that they are assertible because they involve a revision of the context set, understood as the set of worlds accessible to the participants in a conversation. This revision process is needed to account for the meaning of sentences like (27), in a context where the participants to the conversation assume that it is not raining:

(27) John thinks it is raining.

More precisely, according to Panzeri's proposal, in order to interpret sentences like (27), one has to temporarily assume that the complement proposition is true, even if knowing that it is false, in the same way as in the interpretation of counterfactual

conditionals. Thus, she proposes the following meaning for the verb *think*, defined in the terms of its Context Change Potential (cf. Heim 1992):

(28) c + "α thinks " = {w ∈ c: R_{THINK},w(α, REVϕ(c) + ϕ)}
where, if R_{THINK},w (α, REVϕ(c) + ϕ), then DOXα(w) + ϕ = DOXα(w) (*ib.*: 222)

Regarding predicates like *know*, also indicative governors, Panzeri argues that they would be assertible because they involve a revision of the doxastic set of the agent of knowing. In other words, these predicates would be assertible because they would describe the process of coming to know. In her terms:

> the ϕ [complement] clause is assertible in the step in which it gets added to the agent's doxastic set (this operation effects a real change because Semifactives describe processes of coming to know that have as consequence the "starting" to believe something) (*ib.*: 226)

According to this proposal, the feature "assertibility" is related to different concepts. In the case of verbs like *know*, it is related only to the agent of "knowing", that is, these verbs would involve a change in the set of worlds accessible to such agent, not necessarily a change in the context set, while verbs like *think* would be assertible because they impose a revision on the set of worlds accessible to the participants in the conversation. However, even if this large concept of assertibility is accepted, it fails to explain the selection of the indicative by the (equivalent of the) verb *ignore* (which, at least in Portuguese, in one of its senses means *not knowing*) and by verbs like *know*, *discover* and others when they occur under the scope of negation, like in (29):

(29) John doesn't know that we are here.

In such cases no revision of the input context is observed. That is, the complement clause was not added to the agent's doxastic set and no revision of the set of worlds accessible to the participants of the conversation is observed.

4. Toward an analysis

From the previous discussion it follows that in most Romance languages both the indicative and the subjunctive might occur in sentences that are taken to be true in some epistemic model, and both moods might occur in sentences that introduce new information as in sentences that do not. Therefore, none of the discussed approaches provides a semantic basis that distinguishes the predicates that, in most Romance languages, select the indicative (*assertive predicates* in Hooper's classification) from those that select the subjunctive.

However, hopefully, a semantic distinction might be found if attention is given to the kind of attitude that the (main) predicate expresses. Once assumed

that *modality* is a concept related to the kind of attitude (epistemic modality being the expression of an attitude of knowledge, doxastic modality the expression of an attitude of belief,[4] bouletic modality the expression of an attitude of desire, and so on), the claim that the grammatical category mood is related to modality follows straightforwardly.

4.1 Mood selection and the semantics of attitude verbs

Usually, the indicative is seen as the default mood, the subjunctive being the one associated with particular values. For several languages, this position is compatible with the hypothesis at stake that mood selection is dependent on the kind of attitude expressed by the predicate. In effect, in several languages the subjunctive is selected by those predicates that express a kind of attitude which does not allow the inference that the complement proposition is true in some epistemic model. However, in the case of most Romance languages, the hypothesis that mood selection is dependent on the kind of attitude expressed by the predicate does not seem promising if the focus is set on the predicates that select the subjunctive. In fact, such predicates are associated with a wide range of kinds of attitude, such as attitudes of deontic nature (cf., e.g., verbs like *forbid*, *order*, …), attitudes of volition (cf., e.g., verbs like *want*, *prefer*, …), doxastic attitudes (cf., the verb *doubt*), among others, and no semantic (or pragmatic) value seems to unify them, as seen in Section 3.

On the contrary, if the focus is turned into the predicates that select the indicative, it can be seen that all of them express an attitude of epistemic or doxastic nature (that is, an attitude of knowledge or belief). This is clearly the case of verbs like *think* or *believe*, whose meaning is captured by Heim (1992), under the framework of Context Change Semantics:

> (10) [John believes that it is raining] tells us about the world we are in that it is a world accessible from which (more precisely: doxastically accessible for John from which) are only worlds in which it is raining. In other words, (10) informs us that we are in a world w such that it rains in every element of $Dox_J(w)$. So, the CCP [context change potential] of (10) has to be an instruction to eliminate from the original context all but the worlds which fulfill this condition on w. It must be this:
>
> (13) For any c, c + *John believes it is raining*
> $= \{w \in c$: for every $w' \in Dox_J(w)$, it is raining in $w'\}$. (Heim 1992: 188)

The other non-factive predicates that select the indicative also express the information that the complement clause belongs to the main clause's subject state of

4. The distinction between epistemic and doxastic values is not always observed, the term *epistemic* being usually used to refer both knowledge as belief. In this paper, I will also sometimes use this term in its broader meaning, where it is associated with belief or knowledge.

belief. This is the case for declaratives and for fiction verbs, as proposed by Farkas (1992) and Giannakidou (1999), as seen above, and also for predicates like *promise*, which allows the inference that who makes the promise compromises himself to make sure that the complement proposition will become true, otherwise the speech act being infelicitous, in Austin's (1962) sense. Accordingly, all such verbs indicate that their complement proposition belongs to a state of belief (the one of the individual referred by the main clause's subject). In other words, the context change potential (CCP) of such verbs is an instruction to remove from the context all but those worlds from which are doxastically accessible for the main subject only worlds in which the complement proposition is verified.

Considering now the factive predicates that select the indicative, it can be seen that almost all of them convey the same information. In fact, verbs like *know* or *find out*, indicative rulers, indicate that their complement proposition is taken to be true by the subject of the main clause. The difference between the two kinds of verbs is that the factive ones also commit the speaker to the acceptance of their complement proposition, contrary to verbs like *think*; thus conveying the information that their complement proposition is part of the context set (i.e., they trigger the presupposition that their complement proposition is true). Apart from that, non-factive verbs like *think* and factive verbs like *know* express the information that their complement clause belongs to the set of propositions that the main clause's subject takes to be true. Thus, it seems reasonable to assume that verbs like *know* have the same CCP as those like *think* plus the instruction to eliminate from the context set all but those worlds in which their complement proposition is verified. If the context set contains only worlds in which the complement proposition is verified, as in sentences like (30a), then no world is eliminated by this instruction. In other cases, such as (30b), the complement clause might add new information to the common ground:

(30) a. John knows that we are here.
b. I just knew there was an accident with the train. Did you know it?

Given this, the CCP of *know* could be (31):

(31) $c + \alpha$ *knows that* φ is defined iff
$c + \alpha$ *knows that* $\varphi = \{w \in c: \varphi \text{ in } w\}$
When defined,
$c + \alpha$ *knows that* $\varphi = \{w \in c: \text{for every } w' \in \text{Dox}_{\alpha}(w), \varphi \text{ in } w'\}$.

The information that *know* expresses is also included in the meaning of other factive verbs that select the indicative (e.g., *find out*, *verify*), but not in the meaning of the factive verb *forget* or of the Portuguese verb *ignorar* (lit, 'to ignore'), in the sense of *not knowing*. These verbs do not indicate that their complement proposition is taken to be true by the main clause's subject. However, they also indicate that such a proposition belongs to the context set (i.e., they are also factive verbs)

and they also express an epistemic attitude relating the subject of the main clause and the complement proposition. Thus, the verb *ignorar* ('to ignore') is identical to *know*, with the difference that this one gives an instruction to remove from the context set all but those worlds doxastically accessible for the main clause's subject where the complement proposition is verified, while *ignorar* gives an instruction to remove from the context the complement of such set:

(32) c + *α ignora que φ* is defined iff
c + *α ignora que φ* = {w ∈ c: φ in w}
When defined,
c + *α ignora que φ* = c\{w ∈ c: for every w' ∈ Dox_{α}(w), φ in w'}[5]

The first part of (32) states that the complement clause is taken to be true by the speaker, while the part after "when defined" states that such proposition does not belong to the state of belief of the (individual standing for) the subject of the main clause.

This being so, the conclusion arises that all the verbs that select the indicative express the information that their complement proposition is verified in the context set or in the state of belief of the main clause's subject. In other words, these verbs indicate that their complement proposition is taken to be true by the speaker or by the main clause's subject.[6]

This conclusion is not an innovative observation. It is merely a restatement of the observation that indicative rulers are veridical predicates, as proposed by Giannakidou (1999). The problem is that factive predicates that select the subjunctive, such as *regret*, *be glad*, and others, also indicate that the subject of the main clause and the speaker assume the truth of their complement proposition. Hence, they are also veridical predicates. Thus, something else must be at stake in the choice of mood for complement clauses.

The hypothesis under scrutiny is that mood choice is conditioned by the kind of attitude that the main predicate expresses. In the case of the factive predicates like *regret* or *be glad*, subjunctive rulers, they express an attitude of evaluation. As Heim (1992) proposes, a predicate like *be glad* expresses the information that (according to the subject of the main clause) the worlds where the complement proposition is verified are better than those where such proposition is not verified,

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5. If the meaning of *know* is as defined in (31), this will be the meaning of *not know*, or *ignorar*, given the following rule (cf. Heim 1992: 185), where\is set-theoretic complementation: c + *not φ* = c \ (c + *φ*).

6. Verbs like *know* indicate that their complement proposition is taken to be true by both of these entities, verbs like *think* indicate that the subject of the main clause assumes the truth of the complement proposition, and in the case of *ignorar* ('to ignore') only the speaker assumes the truth of the complement proposition.

similarly to predicates like *want*, which differs from *be glad* in the fact that its complement proposition is not taken to be true. Formally, according to Heim's proposal, the meaning of *want* is as expressed in (33) and the evaluative predicate *to be glad* has the meaning indicated in (34):

(33) C(ontext) Change Potential for *want*:
$c + \alpha$ *wants that* φ =
$\{w \in c$: for every $w' \in Dox_{\alpha}(w)$:
$Sim_{w'}(Dox_{\alpha}(w) + \varphi) <_{\alpha,w} Sim_{w'}(Dox_{\alpha}(w)) +$ *not* $\varphi\}$ (Heim 1992: 197)

(34) C(ontext) Change Potential for *be glad*:
$c + \alpha$ *is glad that* φ =
$\{w \in c$: for every $w' \in Dox_{\alpha}(w)$:
$w' <_{\alpha,w} Sim_{w'}(rev\varphi(Dox_{\alpha}(w)) +$ *not* $\varphi\}$ (*ib.*: 206)

Informally, the sentence *John wants it to rain* means that if it rains John is in a more desirable world than if it doesn't rain, while the sentence *John is glad that it rained* means that because it rained John is in a more desirable world than if it hadn't rain.

Given this semantic description, two groups of factive predicates are identified: those that express a comparison between alternatives (e.g., *be glad*, *regret*) and those that only express the information of whether their complement proposition belongs to the main subject's doxastic set (e.g., *know*). In Romance languages, with the exception of Rumanian, this difference is reflected in the mood selected by the predicates: factive predicates of the first kind are subjunctive rulers, while those of the second kind select the indicative.

In synthesis, regarding factive verbs, in most romance languages, the selection of mood seems to be dependent on the kind of attitude conveyed by the predicates: those that express only the information of whether their complement proposition belongs to the main clause subject's epistemic model select the indicative, while those that express some additional information select the subjunctive.

As for non-factive predicates, it might be observed that the indicative mood is selected only by those that express an attitude of belief (such predicates will be taken into consideration in the next subsection). If the attitude they express is of a different kind (cf., e.g., *order*, *allow*, *want*, *be necessary*, …), the indicative is ruled out.

Thus, the inference follows that the indicative is selected by those predicates that state the information of whether the complement clause belongs to an epistemic model and, crucially, no more than this information. It should be stressed that some subjunctive rulers also involve the consideration of an epistemic model. Such is the case of factive predicates like *regret* as well as predicates like *want* (cf. Heim 1992; Giannakidou 1999, and references therein). However, such predicates do not simply state whether the complement clause is

verified in an epistemic model, they also involve a comparison between alternatives, as seen above.

In other words, according to the proposal at stake, the indicative is selected by the predicates that express an epistemic or doxastic attitude relating the subject and the complement proposition. If the attitude that the predicates convey is a different one, the subjunctive will be selected.

Notwithstanding, this hypothesis has to be revised, given that there are verbs (all of them non-factive) which also express a doxastic attitude and select or admit the subjunctive. Such is the case of *doubt*, and of some verbs (e.g., *admit*) that admit both the indicative and the subjunctive in their complement clause, which will now be taken in consideration.

4.2 Mood selection for complement clauses of epistemic non-factive verbs

In most cases, the selection of mood by the epistemic non-factive verbs is dependent on the degree of belief being expressed towards the complement proposition in the following terms: if a high degree of belief is expressed, the indicative is selected; a lower degree or lack of belief leads to the selection of the subjunctive. This explains the selection of the subjunctive by (the equivalents of) *doubt* and the selection of the indicative by predicates like *be sure*, as shown by the following examples from Portuguese:

(35) *duvido de que o comboio chegue a horas*
doubt of that the train arrives-SUBJ at hours
'I doubt that the train arrives on schedule.'

(36) *tenho a certeza de que o comboio vai chegar a horas*
have(1SG) the certainty of that the train will-IND arrive at hours
'I am sure that the train will arrive on schedule.'

Moreover, the selection of mood by this kind of predicates when they occur under negation is easily accounted for. In this case, given that negation reverses the degree of belief being expressed,[7] the indicative is selected for the complement clause of *doubt* and the subjunctive for the complement clause of predicates like *to be sure*:

(37) *não duvido de que ele está doente*
not doubt(1SG) of that he is-IND ill
'I don't doubt he is ill.'

7. As observed by Hengeveld (1988), among others, this is only so with internal negation. If the negative operator is expressing external negation, the mood selected by such predicates is the same as in affirmative sentences.

(38) *não tenho a certeza de que ele esteja doente*
not have(1SG) the certainty of that he is-SUBJ ill
'I am not sure he is ill.'

However, as observed by several authors, the indicative might be selected for those contexts expressing lack of belief if the speaker assumes that the complement clause is true, as in the following example, from Portuguese:[8]

(39) *a Ana não acredita que ele é brasileiro*
the Ana not believes that he is-IND Brazilian
'Ana doesn't believe that he is Brazilian.'

Naturally, if the main clause's subject is identical to the speaker, the selection of the indicative for the complement clause is ruled out, as shown by the following example, since a contradiction would arise:

(40) **não acredito que ele é brasileiro*
not believe(1SG) that he is-IND Brazilian
'I don't believe that he is Brazilian.'

The contradiction derives from the fact that, on the one hand, it is claimed that the subject does not believe that the complement clause is true, but on the other hand, by selecting the indicative, the information follows that the speaker accepts the sentence to be true. Nevertheless, it is possible to select the indicative if different states of belief are taken into consideration, as in the following example:

(41) *eu não acreditava que ele era brasileiro*
I not believed that he was-IND Brazilian
'I didn't believe that he was Brazilian.'

In this case, no contradiction arises. The speaker is informing the hearer that he didn't believe that the complement clause was true at some previous time, but that now he assumes it to be true. Hence, also in this case, an attitude of belief is being expressed.

In the cases considered thus far, in affirmative clauses the non-factive epistemic predicates select either the subjunctive – as is the case for *doubt* – or the indicative – as is the case of *be sure*. In negative clauses, these predicates select the other mood, except if the speaker wants to express his own (present) belief in the complement clause, though the sentence expresses an attitude of non belief relating the subject of the main clause and the complement proposition. Let us now consider

8. Cf., also, the following example from Spanish, discussed in Hengeveld (1988):

(i) *António duda que Juan está enfermo.*
Antonio doubts that Juan is-IND ill

a group of predicates that, in affirmative sentences, accept both the indicative and the subjunctive in their complement clause. Such is the case of *believe* and *think*, which show some parametric variation concerning mood selection.

It is usually assumed that in Italian *credere* (*believe*) and *pensare* (*think*) select the subjunctive, contrary to what is observed in French, Portuguese and other Romance languages, where the equivalents of such verbs are indicative rulers:

(42) *credo / penso che Maria sia in Roma* [Italian]
[I] believe / think that Maria is-SUBJ in Rome

(43) *acredito / penso que a Maria está em Roma* [Portuguese]
[I] believe / think that the Maria is-IND in Rome

Notice, however, that the variation in the selection of mood by predicates of this kind is not only cross-linguistic. In fact, both in Italian as in Portuguese, the complement clause of (the equivalents of) *believe* and *think* may be in the indicative or in the subjunctive mood, as will become clearer below.

Concerning Italian, it has been observed that, to a certain extent, the selection of mood by such verbs is subject only to stylistic variation, some speakers accepting both the subjunctive and the indicative, as shown by (44a–b), from Wandruszka (1991):[9]

(44) a. *Molti credono che la Borsa abbia toccato il suo tetto.*
many believe that the Stock Exch. has-SUBJ touched the its roof
'Many believe that the Stock Exchange had reached its possible maximum.'

b. ⟨⟨*Credo che ora è possibile difendermi da tutte le calunnie.*⟩⟩
[I] believe that now is-IND possible defend-myself from all the slanders (⟨⟨Corriere della Sera⟩⟩, 31/7/1988)
'I believe that now I can defend myself from all the slanders.'

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9. According to the same author, also the verb *pensare* ('think') may select indicative or subjunctive:

(i) a. *Qualcuno pensa che siano probabili nuove elezioni.*
anyone thinks that is-SUBJ probable new elections

b. ⟨⟨*… sebenno io pensi che si vive per scrivere e si scrive per vivere.*⟩⟩
although I think that one lives-IND to write and writes to live (⟨⟨Corriere della Sera⟩⟩, 31/7/1988)

The author informs that in formal registers, *pensare* preferably selects indicative and *credere* subjunctive.

However, according to the same author, in imperative sentences, like (45a–b), only the indicative is allowed:

(45) a. *creda che io sono / *sia veramente mortificato*
believe that I am-IND / am-SUBJ really sorry

b. *Ma pensi che tutti sono schierati contro di noi.*
But think that everyone is-IND entrenched against of us
'Just think that everyone is turned against us.'

Concerning Portuguese, the verb *acreditar* ('believe'), as well as some other verbs (e.g., *admitir* ('admit'), *supor* ('suppose')), may also select the indicative or the subjunctive:

(46) *acredito que ele está / esteja doente*
[I] believe that he is-IND / is-SUBJ ill

In this language, the choice of mood by these verbs is reflected on the interpretation: the selection of the indicative expresses a stronger belief (of the main subject) about the truth of the complement clause than the one that is expressed if the subjunctive is selected. In fact, if a strong belief is expressed, the selection of the subjunctive appears odd, the same being the case with the selection of the indicative if a low degree of belief is being conveyed:

(47) *acredito sinceramente que está / ?esteja doente*
believe(1SG) sincerely that [he] is-IND / ?is-SUBJ ill
'I really believe that he is ill.'

(48) *acredito, e tenho quase a certeza, que ele*
believe(1SG), and have almost the certainty, that he
está / ?esteja doente
is-IND / ?is-SUBJ ill
'I believe (and I am almost sure) that he is ill.'

(49) *recuso-me a acreditar que ele esteja / ?está doente*
refuse(1SG)-me to believe that he is-SUBJ / ?is-IND ill
'I refuse to believe that he might be ill.'

Thus, in Portuguese, the selection of mood by non-factive epistemic predicates seems to be linked to the degree of belief expressed. Predicates like *to be sure* convey a high degree of believe and select the indicative; *doubt* (as well as *deny*) conveys a low degree of belief and selects the subjunctive; while predicates like *believe* may express a high or a low degree of belief and, thus, admit both moods in their complement clause.

In other words, the selection of the indicative or the subjunctive by non-factive epistemic predicates is related to the number of worlds (doxastically accessible to

the main clause's subject) where the proposition is verified. This remark can be stated along the following lines:

(50) with the indicative, the indication is given that the complement clause is verified in *all* possible worlds doxastically accessible to the subject of the main clause; with the subjunctive, the indication is given that the complement clause is verified in *none or only in some* possible worlds doxastically accessible to the subject of the main clause.

However, this can not be the whole story. In effect, in Italian the situation is apparently different. The selection of the indicative or the subjunctive in sentences like (51) does not signal different degrees of belief:

(51) *Gianni crede / pensa che Maria è / sia in Roma*
Gianni believes / thinks that Maria is-IND / is-SUBJ in Rome

Moreover, in Portuguese, the verb *pensar* ('think') may also select the indicative or the subjunctive in sentences like the following and this mood variation is not linked to different degrees of certainty:

(52) *pensei que a Ana estava / estivesse doente*
thought(1SG) that the Ana was-IND / was–SUBJ ill
'I thought that Ana was ill.'

In fact, (52), either with the indicative or the subjunctive, may be felicitously asserted in a context where the speaker accepts that Ana is ill, as well as in a context where he accepts that she isn't.

The selection of the subjunctive in (52) is not to be confused with cases like the following, which convey the information that, at time of speech, the speaker takes the complement clause to be false, contrary to his former belief:

(53) *sempre pensei que ele ganhasse as eleições*
always thought(1SG) that he win-SUBJ the elections
'I always thought that he would win the elections.'

In this case, the selection of the subjunctive is explained by (50): the proposition is not verified in all the worlds doxastically accessible to the subject of the main clause.

Given this picture, the question that remains to be answered is the possibility of selecting the subjunctive or the indicative when the same degree of certainty is conveyed, a situation that is observed in Portuguese (cf. (52)) as well as in Italian (cf. (51)).

Recall that in Italian the subjunctive may be selected in sentences like (51), but not in imperative sentences, like (54):

(54) *creda che io sono / *sia veramente mortificato*
believe that I am-IND / am-SUBJ really sorry

The attitude of the speaker concerning (51) and (54) is clearly different. In the latter case, he is expressing his own belief in the complement clause, while in (51) he is only reporting someone else's belief, remaining silent as to whether he accepts the complement proposition to be true. Likewise, in Portuguese, by asserting sentences like (52), the speaker is reporting a previous belief, not saying whether he still believes that such proposition is true. Thus, there is some relation between mood selection and reported speech. The subjunctive may be selected only in those cases where the speaker is merely reporting a belief, not necessarily compromising himself with the acceptance, at speech time, of the truth of the complement proposition. If the speaker expresses his own belief in the complement clause (at speech time), the indicative is the only mood that may be selected. Hence the selection of the indicative in the following sentences:

(55) *a Ana não acredita que ele é*-IND *brasileiro* [Portuguese]
'Ana doesn't believe that he is Brazilian'

(56) *Antonio duda que Juan está*-IND *enfermo*. [Spanish]
'Antonio doubts that Juan is ill'

(57) *Creda che io sono*-IND *veramente mortificato*. [Italian]
'Believe that I am really sorry'

4.3 General overview

The discussion provided in the last subsections allows the identification of two issues operative in the selection between the indicative and the subjunctive in most Romance languages. The first issue is the kind of attitude that the predicate conveys. Only epistemic predicates (those that merely state whether the complement proposition belongs to a doxastic set) are indicative rulers. The second one is quantification over possible worlds. The indicative is selected only if the complement proposition is verified in all doxastically accessible worlds (accessible either to the individual referred by the subject of the main clause, as in *he believes it is raining*, or else to the speaker, as in (56) or (57)).[10] Thus, the general conclusion can be sustained that in such languages the indicative is selected when the expressed attitude is one of belief. In the cases of reported belief, the subjunctive may occur because the speaker is not expressing his own belief at utterance time; the indicative may also occur because the speaker is reporting an attitude of belief, i.e., he is making reference to an epistemic state where the proposition is verified.

10. There is a correspondence between this parameter and the concepts of 'extensional anchoring' (Farkas 1992) and 'veridicality' as defined in Giannakidou (1999).

Taking now into consideration mood selection for complement clauses in all the Romance languages, recall that there is a split among this group of languages, with Rumanian following the pattern found in languages as Russian or Modern Greek, contrary to the other Romance languages.

In the group including most of the Romance languages (Catalan, French, Italian, Portuguese, Spanish), mood selection for complement clauses seems to be conditioned by the two issues identified above: quantification over possible worlds and kind of attitude expressed. If there is universal quantification (that is, if the complement proposition is verified in all doxastically accessible worlds), but the attitude is not an epistemic one, the subjunctive is selected. Such is the case of complement clauses of verbs like *regret*. If the attitude is of doxastic nature, but there is not universal quantification (that is, if the relevant proposition is not verified in all the doxasticalliy accessible worlds), the subjunctive is selected. Such is the case for complement clauses of predicates like *doubt*. Thus, in such languages, the indicative is selected only if the attitude expressed is of epistemic or doxastic nature and there is universal quantification over the doxastically accessible worlds.

As for Rumanian, and other non Romance languages, only this last issue seems to be operative in mood selection. The indicative is selected by those predicates whose complement proposition is verified in all the doxastically accessible worlds, regardless of what kind of attitude the predicates express.

In a simple way, the proposal at stake is that in Rumanian the indicative is selected if the truth of the proposition is accepted, while in the other romance languages the indicative is selected if the acceptance of the truth of the proposition is expressed. This corresponds perhaps to the wide spread intuition that the indicative is the mood of assertion. However, as seen above, such hypothesis is not sustainable under the Stalnakerian concept of assertion (neither under Panzeri's concept of the term). Hopefully, the Context Change Potential framework will prove to be a useful one for the formalization of the intuition, along the following lines:

i. in all Romance languages, the indicative is selected for a proposition *p* only if the instruction is given to consider an epistemic model (i.e., a set of worlds associated with an individual *x*, representing what *x* believes, dreams, says…) where *p* is verified.
ii. in Rumanian, (i) is a necessary and sufficient condition for the selection of the indicative
iii. in the other Romance languages, if no information apart from (i) is provided, the indicative is selected; otherwise the subjunctive occurs.

As an illustration of (iii), consider two classes of predicates that select the subjunctive: factive predicates like *regret* and causatives.

The meaning of the factive predicates that select the subjunctive (e.g., *regret*, *be glad* …) leads to the consideration of an epistemic model where their complement proposition is verified; hence, condition (i) is fulfilled. However, as seen above, such predicates express a comparison between the worlds where the complement proposition is verified and those where it isn't. Hence, it is not the case that all the information provided by a sentence with such predicates is the instruction to consider an epistemic model where the sentence is verified. Therefore, the subjunctive is selected.

As for causatives, their complement proposition may also be taken to be true (i.e., it may be verified in an epistemic model), as shown by the following examples, from Portuguese:

(58) *a chuva* ***fez com que*** *a Ana chegasse*-SUBJ *atrasada*
'The rain caused Ana to arrive late.'

(59) *a chuva* ***não impediu*** *que a Ana saísse*-SUBJ.
'The rain didn't prevent Ana from leaving.'

However, the information provided by these sentences is more than just the instruction to consider an epistemic model where the complement proposition is verified. In addition to such instruction, (58) informs that the rain was the cause for the event described by the complement clause and (59) informs that (contrary to expectations) the rain was not an impeditive reason for Ana to leave.

5. Conclusion

Departing from the assumption that mood is a grammatical category expressing modality (understood as a kind of attitude towards a proposition), the observation was made that in Romance languages a relation exists between the indicative and epistemic or doxastic modality, while the subjunctive does not signal any particular modal value, being a default mood instead, occurring in those contexts that do not lead to the selection of the indicative.

In fact, in all the Romance languages the indicative may be selected for complement clauses only if the proposition corresponding to such clause is verified in an epistemic model (that is, if the proposition is verified in all the worlds doxastically accessible to an entity). Thus, there is a link between the indicative and epistemic or doxastic modality. As for the subjunctive mood, it may be linked to different kinds of modality, such as deontic modality (cf., e.g., subjunctive rulers like *order* or *forbid*), bouletic modality (cf., e.g., subjunctive rulers like *want* or *wish*), among other kinds of modality, including epistemic modality (cf., the subjunctive

ruler verb *doubt* and predicates like *believe*, which allow both moods in their complement clause).

Regarding the difference on mood selection that distinguishes Rumanian from the other Romance languages, the proposal was made that it is linked to the following question: apart from the information that the complement proposition is true (verified in all the worlds doxastically accessible to an entity), is there any other piece of information provided by the main predicate? In Rumanian, the answer to this question is irrelevant for the selection of the indicative or the subjunctive, but not in the other Romance languages, where the indicative may be selected only if the answer is negative.

The intuition that in Rumanian (as in several non-Romance languages) the subjunctive is the mood of irreality while in the other Romance languages it is the mood of non-assertion (cf. Noonan 1985; Hengeveld 2004) is subsumed under the proposal advocated in this paper, which, hopefully, gives some contribution to the characterization of such intuition.

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'Out of control' marking as circumstantial modality in St'át'imcets*

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This paper provides a unified semantic analysis of the so-called 'out-of-control' circumfix *ka-…-a* in St'át'imcets (Lillooet Salish). *ka-…-a* expresses an initially puzzling range of meanings, including 'be able to', 'manage to', 'suddenly', 'accidentally', and 'non-controllable'. We propose that *ka-…-a* encodes circumstantial modality; we show that its various meanings all reduce to either an existential (ability) or universal (involuntary action) interpretation. Our analysis provides further support for a striking difference between St'át'imcets and English. In English, modals lexically encode quantificational strength, but do not encode distinctions between epistemic, deontic and circumstantial interpretations. St'át'imcets modals display exactly the inverse pattern (Rullmann et al. 2008). In line with this, *ka-…-a* lexically encodes circumstantial modality, but does not encode quantificational strength. The parallel between *ka-…-a* and other St'át'imcets modal elements provides support for our analysis, in contrast to previous accounts (e.g., Demirdache 1997), which treat *ka-…-a* as primarily aspectual in nature.

1. Introduction

The so-called 'out-of-control' circumfix *ka-…-a* in St'át'imcets (Lillooet Salish) expresses an initially puzzling cluster of meanings, including 'be able to', 'manage to', 'suddenly', 'accidentally', and 'non-controllable'. These are illustrated in (1a–e) respectively.

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*We are very grateful to St'át'imcets consultants Gertrude Ned, Ceda Scotchman, Laura Thevarge, Rose Agnes Whitley and the late Beverley Frank. We are also very grateful to Jan van Eijk, Angelika Kratzer, Sabine Iatridou, Donna Gerdts, an anonymous reviewer, and audiences at the TAMTAM Workshop (Radboud University, Nijmegen, 2006), the Semantic Interfaces Workshop (Harvard University, 2007), the 43rd Chicago Linguistic Society Meeting (University of Chicago, 2007), and SULA 4 (São Paulo, Brazil, 2007). Errors are our own. This research is supported by SSHRC grants #410-2002-1715, #410-2003-1138 and #410-2005-0875.

(1) a. *'be able to'*

wá7=lhkalh=t'u7 ***ka****-nás-****a*** *ekw7úna* *Sát'=a* *snímulh*[1]
IMPF=1PL.SUBJ=ADD KA-go-A right.over.there Lillooet=EXIS 1PL. EMPH
'We can go to Lillooet by ourselves.' (Frank et al. 2002)

b. *'manage to'*

ka*-qám't-s=kan-****a*** *ta=wá7* *ts'áq'-n-an*
KA-hit-CAUS=1SG.SUBJ-A DET=IMPF throw-DIR-1SG.ERG
'I managed to hit the target.' (Alexander et al. 2006)

c. *'suddenly'*

ka*-lhéxw-****a*** *ta=n-sqáx7=a*
KA-appear-A DET=1SG.POSS-dog=EXIS
'My dog appeared suddenly.' (Frank et al. 2002)

d. *'accidentally'*

ka*-kwís-ts=kan-****a***
KA-fall-CAUS=1SG.SUBJ-A
"I accidentally dropped it." (Frank et al. 2002)

e. *'non-controllable'*

ka*-cátq-****a*** *ta=t'ánam'ten=a*
KA-rise-A DET=moon=EXIS
'The moon rose.' (Alexander et al. 2006)

In this paper, we present a detailed analysis of the semantics of this morpheme. Our central hypothesis is that *ka-…-a* encodes circumstantial modality, and that its various meanings all reduce to either an existential (ability) or universal (involuntary action) interpretation.

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1. St'át'imcets data are given in the van Eijk practical orthography now in general use in St'át'imc communities; see the Appendix for a conversion chart to the IPA. Abbreviations are as follows: ACT = active intransitivizer, ADD = additive, ADHORT = adhortative, ANTI = antithetical, AUT = autonomous intransitivizer, CAUS = causative (non-control) transitivizer, CIRC = circumstantial modal, COMP = complementizer, CONJ = conjunctive (subjunctive) subject, COUNTER = counterfactual, C_2RED = (V)C_2 reduplication, DEM = demonstrative, DET = determiner, DIR = directive transitivizer, EMPH = emphatic, EPIS = epistemic, ERG = ergative (transitive) subject, EXIS = existential, EVID = evidential, FOC = focus, FUT = future, IMPF = imperfective, INCH = inchoative, IND = indirective transitivizer, IRR = irrealis, LOC = locative, MID = middle intransitivizer, NEG = negation, NOM = nominalizer, OBJ = object, PASS = passive, PL = plural, POSS = possessive, PRSP = presuppositional, RED = redirective (relational) transitivizer, RFL = reflexive, SG = singular, STA = stative, SUBJ = (indicative) subject, TOP = topic maintenance marker, YNQ = yes-no question. A dash (–) marks an affix boundary and an equals sign (=) marks a clitic boundary. % marks examples where there is dialectal or idiolectal variation, and # marks examples whch are infelicitous in a given discourse context.

Our analysis provides support for a striking cross-linguistic difference between the Sťáťʼimcets modal system and more familiar (primarily Indo-European) systems, which we have detailed in previous work: see Rullmann et al. (2008) and Matthewson et al. (2007). According to standard formal semantic analyses of Indo-European systems, modals are quantifiers over possible worlds whose quantificational strength is lexically specified as e.g., universal or existential, while differences between epistemic, deontic and other modal interpretations are derived from implicit conversational backgrounds, rather than from lexical ambiguity (Kratzer 1981, 1991). However, we have previously shown that the lexical specification of Sťáťʼimcets modals is the inverse of the standard model: differences in modal conversational backgrounds are lexically specified (as e.g., epistemic or deontic) but quantificational strength is not, leading to quantificational variability between existential and universal readings. The current paper extends this analysis by demonstrating that *ka-…-a* lexically encodes circumstantial modality, but does not encode differences in quantificational strength. The close semantic parallels between *ka-…-a* and other uncontroversially modal elements in Sťáťʼimcets provide support for our modal analysis of *ka-…-a*, in contrast to previous accounts, which treat it as either an 'out-of-control' marker (van Eijk 1997) or an event structure operator (Demirdache 1997; Davis & Demirdache 2000; Davis 2006).

The structure of the paper is as follows. Section 2 outlines the basic morphosyntactic properties of *ka-…-a.* In Section 3 we provide a detailed examination of its five possible interpretations, before going on in Section 4 to reduce these five interpretations to two: *ability* and *no-choice.* Section 5 contains the core of our analysis: after introducing the essentials of the Kratzerian framework we employ, we argue that the ability interpretation is that of an existential circumstantial modal, and that the no-choice interpretation is that of a universal circumstantial modal. We then unify the existential and universal interpretations by treating them both as universal quantifiers over sets of accessible worlds, with the difference between the two interpretations determined by the size of the set of worlds. Section 6 contains a comparison of our analysis to previous approaches to *ka-…-a.* Section 7 concludes.

Sťáťʼimcets is a Northern Interior Salish language spoken in the southwestern interior of British Columbia, Canada. It has two major dialects, which are mutually intelligible but differ in various lexical, morphological, and syntactic respects. None of these differences are relevant to the current study, which draws on data from both dialects. Sťáťʼimcets is highly endangered, with fewer than 100 first language speakers remaining.

The data in this paper are drawn both from textual materials and from primary fieldwork. We have used a variety of elicitation techniques in our fieldwork, including judgments about the felicity and/or truth of utterances in particular

discourse contexts, as well as translations from English to St'át'imcets and vice-versa. See Matthewson (2004) for further discussion of the methodology employed here.

2. Introducing the St'át'imcets marker *ka-…-a*

The discontinuous morpheme *ka-…-a* is glossed as 'resultative' in van Eijk (1997) and as 'out of control' in Demirdache (1997) and Davis and Demirdache (2000). We gloss it from now on as 'circumstantial', in anticipation of our own circumstantial modal analysis.

Morphologically, *ka-…-a* is unique in St'át'imcets, and unusual cross-linguistically, in consisting of a discontinuous affix. Both the prefixal and suffixal parts of the morpheme are probably historically related to independent elements: *ka-* to the modal *ka* 'deontic/irrealis', and *-a* to the 'reinforcing' or 'existential' enclitic *=a*.[2] However, synchronically, both parts of *ka-…-a* are clearly affixal, as shown in particular by the 'mobility criterion' (Davis 2000): in contrast to clitics, affixes remain fixed to the main predicate in clauses containing pre-predicative auxiliaries. This is illustrated in (2–4). In (2) and (3), we see that the enclitics *=ka* and *=a* obligatorily attach to the auxiliary *huz'* 'going to', rather than to the main predicate *nas* 'go'. In contrast, as shown in (4), both elements of circumstantial *ka-…-a* remain attached to the main predicate, irrespective of the presence of the auxiliary.

(2) a. ***huz'***=*lhkan*=***ká***=*hem'*=*t'u7* *nas*
going.to=1SG.SUBJ=**IRR**=ANTI=ADD go
'I should go.'

b. * ***huz'***=*lhkan*=*hém'*=*t'u7* *nás*=***ka***
going.to=1SG.SUBJ=ANTI=ADD go=**IRR**
'I should go.'

(3) a. *ti*=***húz'***=***a*** *nas*
DET=**going.to**=**EXIS** go
'the one who is going to go'

b. * *ti*=***húz'*** *nás*=***a***
DET=**going.to** go=**EXIS**
'the one who is going to go'

2. For a semantic analysis of *ka*, see Rullmann et al. (2008). For discussion of *=a*, see Matthewson (1998).

(4) a. * ***ka-huz'***=*lhkan-****á***=*hem'*=*t'u7* *nas*
CIRC-going.to=1SG.SUBJ-**CIRC**=ANTI=ADD go
'I'll be able to go.'

b. ***huz'***=*lhkan=hém'*=*t'u7* ***ka****-nás-****a***
going.to=1SG.SUBJ=ANTI=ADD **CIRC**-go-**CIRC**
'I'll be able to go.'

The affixal status of *ka-…-a* distinguishes it from other modals in St'át'imcets, which are all second position clitics (or occasionally, main predicates). This reflects a structural difference: *ka-…-a* is in the c-command domain of the subject, whereas other modals have sentential scope.

By and large, the distribution of *ka-…-a* is free. It attaches to nouns and adjectives as well as to both transitive and intransitive verbs, and it is unrestricted by argument structure. However, unlike other modals, it is subject to certain morphological co-occurrence restrictions. These do not affect the main thrust of the argumentation given here, but they have influenced previous accounts of *ka-…-a*; we will therefore defer discussion of them until Section 6, when we compare our own account to competing analyses.

3. The interpretations of *ka-…-a*

As mentioned above, there are five salient interpretations associated with *ka-…-a*; see van Eijk (1997: 51), Davis (2006: Chapter 25), and Demirdache (1997) for previous discussion.[3] These are listed in (5). We use the term 'interpretation' here in order to avoid the presumption that *ka-…-a* is ambiguous between different readings; in fact, one of the main claims of this paper is that these different interpretations can be captured by a unified analysis that posits no lexical ambiguity for *ka-…-a*.

(5) *Interpretations of* ***ka-…-a***:
a. ability
b. manage-to
c. accidentally
d. suddenly
e. non-controllable

3. Davis (2006) and Demirdache (1997) claim that there are four interpretations; we have added the fifth 'non-controllable' one.

In this section we provide further exemplification of each of these five interpretations. We then reduce the five interpretations to two, which we will argue in Section 4 correspond to existential and universal circumstantial modal uses.

3.1 The *ability* interpretation

The *ability* interpretation is illustrated in (6–7); it covers typical ability attributions, which in English use *can* or *be able to*.

(6) a. *cúy'=lhkacw=ha* ***ka**-cwák-**a*** *lh=ma7g'úlm'ecw=as*
going.to=1SG.SUBJ=YNQ **CIRC**-wake-**CIRC** COMP=daybreak=3CONJ
'Are you going to be able to wake up at dawn?' (Davis 2006)

b. *wá7=lhkan* ***ka**-cát-s-**a*** *ta=k'ét'h=a*
IMPF=1SG.SUBJ **CIRC**-lift-CAUS-**CIRC** DET=rock-EXIS
'I can lift the rock.'

c. *lh=núkw=as,* *xát'-min'=lhkan* *kw=en=s=wá*
COMP=some=3CONJ want-RED=1SG.SUBJ DET=1SG.POSS=NOM=IMPF
syéy'qtsa7 *múta7* …
girl again
'Sometimes, I want to be a girl again…'

t'u7 *cw7áoz=t'u7* *kw=s=**ka**-k'uk'wmi7t-kálh-**a*** *múta7*
but NEG=just DET=NOM=**CIRC**-child-1PL.POSS-**CIRC** again
wi=snímulh *qelhmín*
PL=1PL.EMPH old.person
'…but we old people can't be children again.'[4]

(7) a. *cw7aoz* *k=wa=s* ***ka**-gwél-**a*** *i=nesnús=a*
NEG DET(NOM)=IMPF=3POSS **CIRC**-burn-**CIRC** PL.DET=damp=EXIS
sp'ams
firewood
'The damp firewood can't be burned.'

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4. Note that *ka-…-a* in this example is affixed to a nominal predicate. In fact, there are no categorial restrictions on its distribution, and – once pragmatic effects are taken into account – no categorial restrictions on its interpretation, either. (This contradicts the claim in Davis and Matthewson 1999 that *ka-…-a* may not attach to nouns, which the first two authors of this paper hereby retract). The unrestricted distribution of *ka-…-a* distinguishes it from aspectual affixes, which only attach to non-nominal predicates (e.g., the inchoative marker *–7-/-p*, as discussed by van Eijk and Hess 1986). This distinction in turn provides an argument against an aspectual account of *ka-…-a*, and in favor of the modal approach taken here, where neither the distribution of *ka-…-a* nor its interpretations are directly restricted by event structure. See 6.2 below for further discussion.

b. *lh=as* *pipántsek,* *cw7aoz* *kwelhkálh*
COMP=(IMPF)3CONJ summer NEG DET+NOM+IMPF+1PL.POSS
ka-gwél-*cal*-***a,*** *nilh* *t=s=k'ac-7úl=s=a*
CIRC-burn-ACT-**CIRC** FOC DET=NOM=dry-really=3POSS=EXIS
ta=tmícw=a
DET=land=EXIS
'We can't burn in the summer because the land is too dry.'

c. *cw7aoz* *kw=s=**ka**-gwél-s-tum'-**a*** *i=sp'áms=a*
NEG DET=NOM=**CIRC**-burn-CAUS-1PL.ERG-**CIRC** PL.DET=firewood=EXIS
'We can't get the firewood to burn.'

Example (7) shows *ka-…-a* affixed to the same root, but with three different argument/event structures. In (7a), it attaches to the bare (unaccusative) root *gwel* 'get burned' (an achievement); in (7b) it attaches to the active intransitive *gwel-cál* 'do burning' (an activity); and in (7c) it adds to the causative transitive *gwel-s* 'burn something' (an accomplishment).[5]

3.2 The *manage-to* interpretation

The *manage-to* interpretation is illustrated in (8); these examples indicate that there was some extra effort required to ensure that the event happened.

(8) a. ***ka**-gwél-s=kan-**a***
CIRC-burn-CAUS=1SG.SUBJ-**CIRC**
'I managed to get it lit.' (van Eijk 1997: 51)

b. ***ka**-cwák-s=kan-**a*** *na=wá7* *xúq'wleqs* *n-snúk'wa7*
CIRC-wake-CAUS=1SG.SUBJ-**CIRC** DET=IMPF snore 1SG.POSS-friend
'I managed to wake up my snoring friend.' (Davis 2006)

c. ***ka**-t'ál-**a**=ha* *ta=káoh-sw=a* *l=ta=kwézkwzem=a*
CIRC-stop-**CIRC**=YNQ DET=car-2SG.POSS=EXIS on=DET=smooth=EXIS
s7aol̲t
ice
'Did your car manage to stop on the slippery ice?' (Literally: 'Was your car stoppable on the slippery ice?') (Davis 2006)

d. *qwenúxw=kan* *inátcwas,* *t'u7* ***ka**-tsunam'-cal=lhkán-**a**=t'u7*
sick=1SG.SUBJ yesterday but **CIRC**-teach-ACT=1SG.SUBJ-**CIRC**=ADD
'I was sick yesterday, but I still managed to teach.' (Davis 2006)

5. For work on aspectual classes in Sťát'imcets, see Bar-el et al. (2005) and references therein.

3.3 The *accidentally* interpretation

The examples in (9) illustrate the *accidentally* interpretation. The English translations do not always contain the word 'accidentally' (see for example (9e)), but the meaning is that the action was not on purpose.

(9) a. ***ka**-gwél-s=kan-**a*** *ta=n-gúy'tten=a*
CIRC-burn-CAUS=1SG.SUBJ-CIRC DET=1SG.POSS-bed=EXIS
'I accidentally set my bed on fire.' (Davis 2006)

b. ***ka**-gúy't=kan-**a**,* *xúq'wleqs=kan* *aylh,*
CIRC-sleep=1SG.SUBJ-CIRC snore=1SG.SUBJ then
ka**-cwák-s=kan-**a *na=n-snúk'w7=a*
CIRC-wake-CAUS=1SG.SUBJ-CIRC DET=1SG.POSS-friend= EXIS
'I fell asleep, started snoring, and accidentally woke up my friend.'
(Davis 2006)

c. ***ka**-mul-aká7=lhkan-**a*** *l=ta=slhúm'=a*
CIRC-dip-hand=1SG.SUBJ-CIRC in=DET=soup=EXIS
'I dipped my hand in the soup by accident.' (Davis 2006)

d. ***ka**-sék'w-s-as-**a*** *ta=nk'wanústen'=a* *ta=twéww'et=a*
CIRC-break-CAUS-3ERG-CIRC DET=window=EXIS DET=boy=EXIS
'The boy broke the window accidentally.' (Davis 2006)

e. ***ka**-nk'méq'w=lhkan-**a*** *aylh* *l=ti=n-gwáts'-cal-ten=a*
CIRC-immerse=1SG.SUBJ-CIRC then in=DET=LOC-irrigate-ACT-thing=EXIS
'I fell into the ditch.' (Matthewson 2005: 158)

3.4 The *suddenly* interpretation

The *suddenly* interpretation is illustrated in (10). The meaning is that the event happened suddenly or abruptly.

(10) a. ***ka**-q'ek'w-ts=kán-**a***
CIRC-close-mouth=1SG.SUBJ-CIRC
'My mouth got closed suddenly.' (Alexander et al. in prep.)

b. ***ka**-lhexw-min-ts=kácw-**a***
CIRC-come.up-RED-1SG.OBJ=2SG.SUBJ-CIRC
'You came up to me all of a sudden.' (Alexander et al. 2006)

c. *ni..lh* *s=cuy'=s* ***ka**-tígw-**a*** *i=tíntin=a* *kentákem*
FOC NOM=start=3POSS CIRC-ring-CIRC PL.DET=bell=EXIS everywhere
'And suddenly bells started ringing everywhere.' (Matthewson 2005: 454)

d. *qwaqwx-mín=lhkan* *ta=scwelálhp=a,* ***ka**-cwák=kan-**a*** *aylh*
nightmare-RED=1SG.SUBJ DET=ghost=EXIS CIRC-wake=1SG.SUBJ-CIRC then
'I had a nightmare about a ghost, then I woke up suddenly.' (Davis 2006)

e. *nilh láti7 **ka**-ť'ál=s-**a** ta=káoh-s=a*
FOC there CIRC-stop=3POSS-CIRC DET=car-3POSS=EXIS
'His car suddenly stopped.' (Matthewson 2005: 230)

3.5 The *non-controllable* interpretation

The *non-controllable* interpretation arises when an event is in principle not controllable by an animate agent. This interpretation occurs with many unaccusative predicates, including weather verbs, as in (11a–b), verbs of appearance, as (11c), and change-of-state verbs, as in (11d). In (11d), the only argument of the predicates *lhot* 'get squished' and *teqw* 'get dented' is the theme. The raspberries and the pot are in principle not in control of whether they get squished or dented. Note that there is often no explicit rendering of the 'non-controllable' aspect of meaning in the English translations.

(11) a. ***ka**-ť'ál-**a** ta=sk̓éxem=a, kekáw' kent7ú ku=szénk*
CIRC-stop-CIRC DET=wind=EXIS far around DET=circle
'The wind stopped blowing, far around that circle.' (Davis 2006)

b. ***ka**-lhéxw-**a** ta=snéqwem=a*
CIRC-come.up-CIRC DET=sun=EXIS
'The sun came out.' (Davis 2006)

c. *lts7a sek'wel'wás=a lh=tákem=at **ka**-hál'h-**a***
here Cayoose.Creek=EXIS COMP=all=1PL.CONJ CIRC-show-CIRC
'We were all born here at Cayoose Creek.' (Matthewson 2005: 96)

d. ***ka**-lhót-**a** aylh i=s7áy'tsqw=a nilh*
CIRC-get.squished-CIRC then PL.DET=raspberry=EXIS FOC
*ka-téqw=s-**a** ti=n-tsq-ús-tn=a*
CIRC-dent=3POSS-CIRC DET=LOC-put.down-face-thing=EXIS
'The raspberries got squished and the pot got dented.' (Matthewson 2005: 73)

The non-controllable interpretation also shows up on transitive predicates with a non-agentive causer as subject (typically, a natural phenomenon, such as the weather). The non-control/causative transitivizer *-s* is employed in these cases.

(12) a. ***ka**-nlíg̓w-ts-s-as-**a** ta=sk̓éxem=a ta=séps=a*
CIRC-open-mouth-CAUS-3ERG-CIRC DET=wind=EXIS DET=door=EXIS
'The wind opened the door.'

b. *wa7 **ka**-paqu7-s-túmc-as-**a** ta=qv̓alhtmícw=a*
IMPF CIRC-afraid-CAUS-1G.OBJ-3ERG-CIRC DET=storm=EXIS
'That storm scares me.'

Some unaccusative predicates with a non-controllable interpretation show variation between the *ka-…-a* version and a bare root intransitive (13a–b), or between the

ka-…-a version and a form containing the inchoative morpheme (14a–b) or –(V) C_2 ('out-of-control') reduplication (15a–b). In these cases, there is no detectable difference in meaning between the two forms.[6]

(13) a. % *lan wa7* ***ka****-kwís-****a*** *i=pétskelh-ts=a i=sráp-a*
already IMPF **CIRC**-fall-**CIRC** PL.DET=leaf-3POSS=EXIS PL.DET=tree=EXIS
'The leaves have already fallen from the trees.'

b. *lan wa7 kwis i=pétskelh-ts-a i=sráp=a*
already IMPF fall PL.DET=leaf-3POSS=EXIS PL.DET=tree=EXIS
'The leaves have already fallen from the trees.'

(14) a. *xwém=t'u7 kw=s=****ka****-mág=s-****a***
fast=ADD DET=NOM=**CIRC**-bright=3POSS-**CIRC**
'It got bright quickly.'

b. *xwém=t'u7 kw=s=má-7-eg'=s*
fast=ADD DET=NOM=bright(**INCH**)=3POSS
'It got bright quickly.'

(15) a. ***ka****-qácw-****a*** *ti=n-ts'íp'-men=a*
CIRC-break-**CIRC** DET=1SG.POSS-cold-instrument=EXIS
'My fridge broke (down).'

b. *qácw-****ecw*** *ti=n-ts'íp'-men=a*
break-$\mathbf{C_2}$**RED** DET=1SG.POSS-cold-instrument=EXIS
'My fridge broke (down).'

In fact, some non-controllable predicates denoting changes of state have been lexicalized so that for some speakers they only occur with *ka-…-a*, as shown in (16), while still others have been lexicalized so that they fail to occur with *ka-…-a* altogether, as shown in (17).

(16) a. *xwém=t'u7 kw=s=****ka****-t'ép=s-****a***
fast=ADD DET=NOM=**CIRC**-get.dark=3POSS-**CIRC**
'It got dark fast.'

b. * *xwém=t'u7 kw=s=t'ep=s*
fast=ADD DET=NOM=get.dark=3POSS
'It got dark fast.'

6. There is considerable speaker variation as to the acceptability of non-controllable predicates with and without *ka-…-a*. One of our speakers rejected (13a), for example, while another found it fine.

(17) a. % *xwém=t'u7 kw=s=**ka**-máqa7=s-**a***
fast=ADD DET=NOM=**CIRC**-snow=3POSS-**CIRC**
'It suddenly snowed.'[7]

b. *xwém=t'u7 kw=s=máqa7=s*
fast=ADD DET=NOM=snow=3POSS
'It suddenly snowed.'

Variation also occurs with non-controllable causatives. Some speakers reject *ka-…-a* with non-agentive subjects on certain predicates, in favor of causativized inchoatives (18) or bare causatives (19):

(18) a. % ***ka**-záxw-s-as-**a*** *ta=k'ímal'ts=a ta=snéqwem=a*
CIRC-melt-CAUS-3ERG-**CIRC** DET=ice=EXIS DET=sun=EXIS
'The sun melted the ice.'
Speaker's comment: "Sounds like it was by accident."

b. *za-7-xw-s-ás ta=k'ímal'ts=a ta=snéqwem=a*
melt(**INCH**)-CAUS-3ERG DET=ice=EXIS DET=sun=EXIS
'The sun melted the ice.'

(19) a. % *stám'=as=k'a ku=**ka**-qwenuxw-s-tumc-ás-**a***
what=3CONJ=EPIS DET=**CIRC**-sick-CAUS-1SG.OBJ-3ERG-**CIRC**
'Something or other made me sick.'

b. *stám'=as=k'a ku=qwenuxw-s-túmc-as*
what=3CONJ=EPIS DET=sick-CAUS-1SG.OBJ-3ERG
'Something or other made me sick.'

However, in many cases, non-controllable causatives with and without *ka-…-a* are in free variation, with no detectable difference in meaning:

(20) a. ***ka**-zík-s-as-**a*** *ta=sráp=a ta=qvl̓alhtmícw=a*
CIRC-topple-CAUS-3ERG-**CIRC** DET=tree=EXIS DET=storm=EXIS
'The storm toppled the tree.'

b. *zík-t-s-as ta=sráp=a ta=qvl̓alhtmícw=a*
topple-IMM-CAUS-3ERG DET=tree=EXIS DET=storm=EXIS
'The storm toppled the tree.'

7. Again, there is speaker variation here. One of our consultants accepts (17a), while another rejects it.

In other cases, some speakers even reject non-controllable causatives without *ka-…-a*:

(21) a. ***ka**-sek-qw-s-túmc-as-**a*** *ti=kecmákst=a*
CIRC-hit-head-CAUS-1SG.OBJ-3ERG-**CIRC** DET=branch=EXIS
'The branch hit me by accident (as we were passing by).'

b. % *sek-qw-s-túmc-as* *ti=kecmákst=a*
hit-head-CAUS-1SG.OBJ-3ERG DET=branch=EXIS
'The branch hit me by accident (as we were passing by).'[8]

We suspect that the variation associated with the non-controllable interpretation of *ka-…-a* comes about because of the very close relationship between universal circumstantial interpretations of eventive predicates and plain event descriptions; in fact, in many cases, there are no detectable truth-conditional differences between the two, leading to free variation and apparently arbitrary lexicalization of forms with and without *ka-…-a*. See 5.4.1 below for further discussion.

It is also worth noting that there are other more straightforwardly pragmatic restrictions on which interpretations appear with which types of predicates. For example, it is difficult to accidentally become a chief, but it makes perfect sense to talk about whether one is able to become a chief. Conversely, it is not usual to talk about the sun being able to come up. Nevertheless, many predicates allow multiple interpretations, depending on the context. For example, (9d) above, *The boy broke the window accidentally*, can also mean *The boy managed to break the window*, given an appropriate discourse context. Note also that the ability interpretation is very general and applies even to unaccusatives, yielding the equivalent of English *-able*. One example of this interpretation was given in (7a) above; another is given in (22):

(22) *cw7aoz* *kw=a=s* ***ka**-ts'áqw-**a***
NEG DET(NOM)=IMPF=3POSS **CIRC**-get.eaten-**CIRC**
i=qwenálhp=a, *wá7=iz'* *zúqw-cal!*
PL.DET=Indian.hellebore=EXIS IMPF=PL.DEM die-ACT
'Indian hellebore isn't edible [can't be eaten] – it's poisonous [kills]!'

8. These data contrast with the findings of Demirdache (1997), Davis and Demirdache (2000), Davis (2006), and an earlier version of the current paper (Davis et al. 2007), all of whom claim that the (a) examples in (18–21) should be strictly ungrammatical. Investigation of a wider range of predicates with a larger sample of speakers has convinced us that the incompatibility of *ka-…-a* with non-controllable causatives is in fact a tendency, at best.

4. Unifying the interpretations

In this section we begin the process of unifying the various interpretations of *ka-…-a*. First we argue for a unification of the ability and the manage-to interpretations, and then we combine the accidentally, the suddenly and non-controllable interpretations.

4.1 Manage-to = ability

Davis (2006) (following a suggestion by Demirdache 1997) shows that the manage-to reading of predicates with *ka-…-a*, unlike the English implicative verb *manage*, lacks an actuality entailment. Before we present the evidence for this claim, we introduce some background about English *manage*. As argued by Karttunen (1971) and Karttunen and Peters (1979), a sentence containing *manage* asserts that an event took place, and conventionally implicates that there was some difficulty involved. This is illustrated in (23).

(23) John managed to sit through the Chinese opera.
   a. *Assertion*: John sat through the Chinese opera.
   b. *Conventional implicature*: Sitting through a Chinese opera requires some effort for John. (Bhatt 1999: 179)

As predicted by this analysis, the assertion does not project when *manage* is in the scope of negation, but the conventional implicature does. Thus, the truth of (24) entails the falsity of (23a), but not of (23b):

(24) John didn't manage to sit through the Chinese opera.

In contrast with *manage*, the past tense of an ability attribution, *was able to*, does not carry an actuality entailment. Thus, (25a) is a contradiction, but (25b) is not.

(25) a. # I managed to teach yesterday, but I didn't.
   b. I was able to teach yesterday, but I didn't.

Turning now to St'át'imcets *ka-…-a*, the data show that there is no actuality entailment. Instead, the understanding that the event happened is only a cancelable conversational implicature. This is shown in (26–27). (26a) yields a typical manage-to interpretation; (26b) uses the same predicate and shows that there is no contradiction when the event is asserted not to have taken place.[9]

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9. An anonymous reviewer asks whether the additive particle in (26a) and/or the irrealis marking in (26b) contribute to the (im)possibility of canceling the implicature. It turns out that both particles are optional; the consultant accepts (26a,b), on their respective interpretations, with the particles omitted. However, irrealis marking would be incompatible with the interpretation in (26a) where the teaching actually happened.

(26) a. *qwenúxw=kan i=nátcw=as, t'u7*
sick=1SG.SUBJ when.PAST=day=3CONJ but
***ka**-tsunam'-cal=lhkán-**a**=t'u7*
CIRC-teach-ACT=1SG.SUBJ-**CIRC**=ADD
'I was sick yesterday, but I still managed to teach.' (Davis 2006)

b. *qwenúxw=kan i=nátcw=as,*
sick=1SG.SUBJ when.PAST=day=3CONJ
***ka**-tsunam'-cal=lhkán-**a**=ka, t'u7 cw7áoy=t'u7*
CIRC-teach-ACT=1SG.SUBJ-**CIRC**=IRR but NEG=ADD
'I was sick yesterday. I could have taught, but I didn't.' (Davis 2006)

Similarly in (27), we see clear evidence that *ka-…-a* has a pure ability interpretation, rather than a manage-to one. The assertion that I was able to swallow my medicine is, without contradiction, followed by the assertion that I did not in fact swallow it. This would not be possible if *ka-…-a* meant 'manage to'.

(27) *aol̲sem=lhkán=tu7, páw-alhq'wel't=kan nilh s=cw7ay=s*
sick=1SG.SUBJ=then swollen-throat=1SG.SUBJ FOC NOM=NEG=3POSS
*kw=en=s=**ka**-q'ém-cal-**a** ku=stám'*
DET=1SG.POSS=NOM=**CIRC**-swallow-ACT-**CIRC** DET=what
'I was sick. I had a sore throat, so I couldn't swallow anything.'

ts7ás=kan aylh ama-wíl'c
come=1SG.SUBJ then good-become
'Then I began to get better.'

***ka**-q'ém-s=kan-**a** aylh n-kál'wat=a,*
CIRC-swallow-CAUS=1SG.SUBJ-**CIRC** then 1SG.POSS-medicine=EXIS
t'u7 cw7áoz=t'u7 múta7 kw=en=s=xát'-min',
but NEG=ADD again DET=1SG.POSS=NOM=want-RED
nilh s=7ús-ts-an
FOC NOM=throw.out–CAUS-1SG.ERG
'I was able to swallow my medicine, but I didn't want it any more, so I threw it out.'

These data indicate that what we have been calling the manage-to interpretation does not carry an actuality entailment, but an actuality *implicature* that arises in a past episodic context.[10] We thus follow Davis (2006) in arguing

10. St'át'imcets does not obligatorily encode a past/present tense distinction. Imperfective aspect is overtly marked by the auxiliary *wa7*, but perfective aspect is unmarked: therefore,

that the ability and the manage-to interpretations are reducible to the ability reading.[11]

4.2 Accidentally = suddenly = non-controllable = '*no-choice*'

Davis (2006) argues that the accidentally and the suddenly interpretations of *ka-…-a* are also reducible to a single reading. The basic intuition behind this move is that events that are accidents often happen suddenly, and vice versa. In contrast to Davis (2006), however, we will provide evidence here that it is the accidentalness (= lack of choice) that is critical for this unified reading, not the suddenness. We will therefore name the unified interpretation *no-choice*.

Evidence that the accidental (= lack of choice) aspect of meaning is basic to *ka-…-a* comes from the fact that the suddenly aspect is often cancelable, but the accidental aspect is not. In other words, *ka-…-a* never yields a deliberate-but-sudden reading, only an accidental – and possibly, but *not* necessarily, sudden – reading. This is shown in (28–29), where a deliberate but sudden action does not license *ka-…-a*.

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crucially, the sentences in (25–27) are perfective. See Matthewson (2006) for analysis of the St'át'imcets temporal system.

11. The St'át'imcets data contrast with Bhatt's (1999) and Hacquard's (2006) findings for perfective ability attributions in Modern Greek, Hindi, French and Italian. Bhatt and Hacquard show that in these Indo-European languages, ability attributions with perfective aspect have actuality entailments. Furthermore, Mills (2005: 27) reports that in Tagalog, an imperfective form with the ability/involuntary action (AIA) morpheme (the Austronesian analogue of *ka-…-a*) gives only an ability reading, while a perfective form gives either a manage-to or an involuntary action reading, as shown in (i–ii):

(i) nakakain ko ang lamok
AIA.**IMPF**.eat 1SG.CASE NOM mosquito
'I am able to eat the mosquito.'

(ii) nakain ko ang lamok
AIA.**PERF**.eat 1SG.CASE nom mosquito
'I managed to eat/accidentally ate the mosquito.'

Furthermore, as explicitly stated by Kroeger (1993: 81), the perfective manage-to reading of AIA forms in Tagalog has an actuality entailment, as in Indo-European, not an implicature, as in St'át'imcets. Travis (2000: 180–181) makes the same claim for parallel cases in Malagasy. Obviously, this difference invites further cross-linguistic research.

(28) *Situation: I wanted to do something funny for my kids so I was standing there perfectly still and then suddenly I stuck my tongue out.*

*#**ka**-taolhao7-cít=kan-**a*** *i=sk'wemk'úk'wmi7t=a*
CIRC-tongue-IND=1SG.SUBJ-**CIRC** PL.DET=children=EXIS
'I suddenly stuck my tongue out at the children.'

Consultant's comment: 'That would mean you didn't mean to do it but you did.'

The consultant corrects (29a), which infelicitously contains *ka-…-a*, to (29b), which lacks it.

(29) *Situation: We were sitting in a meeting when suddenly John stood up and ran from the room.*

a. *#**ka**-tálh-lec-**a*** *kw=s=John,* *nilh* *s=qwatsáts=s* *q'ílhil*
CIRC-stand-AUT-**CIRC** DET=NOM=John FOC NOM=leave=3POSS run
'John stood up suddenly, and ran out of the room.'

b. *lep* *kw=s=tálh-lec=s* *s=John,* *nilh*
suddenly DET=NOM=stand-AUT=3POSS NOM=John FOC
s=q'ílhil=s *úts'qa7* *lhel=ta=s-gáw'p=a*
NOM=run=3POSS outside from=DET=NOM-meet=EXIS
'John stood up suddenly, and ran out of the meeting.'

On the other hand, (30–31) show that it is possible to obtain an accidentally-but-*not*-suddenly reading for *ka-…-a*.

(30) *Situation: You are trying to catch a mosquito and your movements as you are doing so look like dancing, so you accidentally dance.*

ts'íla=t'u7 *kw=n=**ka**-q'wez-ílc-**a***
like=ADD DET=1SG.POSS=**CIRC**-keep.time-AUT-**CIRC**
'Looks like I'm almost dancing.'

(31) *Situation: You were sitting in court being on the jury and you were not supposed to stand up until it's time to go. But you were trying to get something out of your pocket and your pocket was really tight and you had to wiggle and squirm and eventually you found that you had stood up by accident while you were trying to get that thing out of your pocket.*

***ka**-talh-lec=kán-**a**,* *nílh=t'u7* *múta7* *n=s=xwem*
CIRC-stand-AUT=1SG.SUBJ-**CIRC** FOC=ADD again 1SG.POSS=NOM=quick
mítsa7q
sit
'I stood up by mistake, so I quickly sat down again.'

(32) *Situation: You're playing a game where you draw with a blindfold on and then look and see how your drawing came out. When you take your blindfold off, you discover that you have accidentally written your name.*

***ka**-mets-s=kan-**á**=k'a* *ti=n-skwátsits=a*
CIRC-write-CAUS=1SG.SUBJ-**CIRC**=EPIS DET=1SG.POSS-name=EXIS
'I drew my name by accident.'

These data suggest that it is the accidentally notion that is basic, and that the suddenly effect is a cancelable implicature. This conclusion is further supported by the fact that the language possesses no separate lexical item to express 'accidentally' (although it does possess a separate lexical item which expresses 'suddenly'–*lep*, as in Example (29b) above).[12]

Once we have unified the accidentally with the suddenly interpretation, we can take a further step and observe that the non-controllable cases share a fundamentally similar semantics. The core idea is that there is a lack of choice or control. In the accidentally cases, this is because an agent who *could* potentially be in control of the event is *not actually* in control; in the non-controllable cases, there was never any agent who is even *potentially* in charge. Note that just like the accidentally cases, the non-controllable cases often implicate suddenness, but they need not, as shown in (33).

(33) a. *skenkín=t'u7* *kw=s=**ka**-t'ép=s-**a***
slow=ADD DET=NOM=**CIRC**-dark=3POSS-**CIRC**
'It gradually got dark.'

b. *t'ák=t'u7* ***ka**-mág-**a**,* ***ka**-mág-**a*** *aylh*
go.along=ADD **CIRC**-get.light-CIRC **CIRC**-get.light-**CIRC** then
'It got light gradually.'

We conclude from the data presented in this subsection that the core meaning of all the non-ability-related interpretations of *ka-…-a* is that something happened – or rather, *had* to happen – without the choice of any agent. The suddenly aspect

12. Furthermore, for one of our speakers, *lep* can itself be affixed with *ka-…-a*, yielding *ka-lép-a*, as in (i):

(i) ***ka**-lép-**a**=t'u7* *k=máqa7=s*
CIRC-suddenly-**CIRC**=ADD DET=SNOW=3POSS
'It suddenly started to snow.'

This is strong additional evidence that 'suddenly' cannot be the basic meaning of *ka-…-a*.

of meaning is merely a conversational implicature, deriving from the fact that accidents usually – but not necessarily – happen all of a sudden.

One further important point is worth making here. Though it is more difficult to demonstrate, the no-choice reading of *ka-…-a* lacks an actuality entailment, just like the ability ('manage to') reading. The reason it is difficult to show this is that when an event *has to* happen, in the normal course of events, *it does* happen. So we need to find an *abnormal* course of events to demonstrate that the actuality of the event is cancelable. The following scenario is designed with this in mind:

(34) *qvl̓ ta=s7exw7unám-s=a k=Gillian i=nátcw=as*
bad DET=cold-3POSS=EXIS DET=Gillian when(PAST)=day=3CONJ
'Gillian had a very bad cold yesterday.'

stexw wa7 n-tqép-leqs
really IMPF LOC-blocked-nose
'Her nose was really plugged up.'

kens-q'á7 ku=t'éc szaq' t'u7 ***ka****-nsnán7-****a***
try-eat DET=sweet bread but **CIRC**-sneeze-**CIRC**
'She started to eat some sweet bread, but she had to sneeze.'

t'u7 t'eqwp-álts ti=tsítcw-s=a nílh=t'u7 s=zuqw=s
but explode-house DET-house-3POSS=EXIS FOC=ADD NOM=die=3POSS
'But then her house exploded and she died.'

Interviewer: "*She never got to eat her sweet bread and she never got to sneeze?*"
Consultant: "*Right*".

In this scenario, we see that the actuality of the sneezing event is cancelable, when events take an unexpected (and tragic) course. This is important in that it shows that the no-choice reading of *ka-…-a* shares fundamental properties with the ability reading, suggesting that even these two apparently quite dissimilar interpretations should ultimately be unified.

This is precisely the task to which we turn in the next section. We provide an analysis according to which the ability reading is an existential circumstantial modal use, and the no-choice reading is a universal circumstantial modal use. Crucially, we do not analyze the two interpretations as a case of lexical ambiguity, but rather of non-specification or generality, following the approach we have taken to other modals in Sťát'imcets (Matthewson et al. 2007; Rullmann et al. 2008). The fact that *ka-…-a* acts just like other modals in Sťát'imcets in lexically specifying conversational background but not quantificational strength provides strong indirect evidence that the current analysis is on the right track, while at the same time reinforcing the generalizations that underpin our previous analysis of modality in Sťát'imcets.

5. *Ka-…-a* as a circumstantial modal

We begin this section by briefly summarizing our previous work on modals in Sťáť'imcets (Matthewson et al. 2007; Rullmann et al. 2008), which is implemented within the formal framework of Kratzer (1977, 1981, 1991). We then introduce Kratzer's specific discussion of circumstantial modality in 5.2, before returning to our analysis of *ka-…-a*. We show in 5.3 that the ability interpretation of *ka-…-a* displays exactly the range of meanings that are predicted for an existential circumstantial modal, and in 5.4 that the no-choice interpretation displays the range of meanings which we expect a universal circumstantial modal to have.[13] In Section 5.5 we turn to the formal analysis, which we implement along the lines of our previous choice-function analysis of modals in Sťáť'imcets.

5.1 Quantificational strength and conversational background: Modals in English and Sťáť'imcets

We start from the standard view within formal semantics that modals are quantifiers over possible worlds. For example, English *must* and *should* are universal quantifiers whereas *can*, *could, may*, and *might* are existential quantifiers. As is well known, English modals can have many different interpretations, including deontic, epistemic, and circumstantial. To account for this, Kratzer (1977, 1981, 1991) argues that the discourse context provides a *conversational background* for the modal. (35) and (36) illustrate epistemic and deontic readings of *must*; here the phrase *in view of…* specifies the conversational background, which is usually left implicit.

(35) Michl must be the murderer. (In view of what is known about the crime.)
EPISTEMIC (Kratzer 1991: 643)

(36) Jockl must go to jail. (In view of what the law provides.)
DEONTIC (Kratzer 1991: 640)

According to Kratzer, the conversational background consists of two components: the *modal base* and the *ordering source*. The modal base is a function that maps each world onto the set of worlds that are accessible from it. In any given world, the modal only quantifies over these accessible worlds. The ordering source ranks worlds in some contextually-determined way and further restricts the domain of quantification of the modal to worlds at one end of the ranking. (35), for example, has an epistemic modal base: *must* only quantifies over worlds which are compatible with our knowledge about the crime in the evaluation world. The set of worlds

13. Nauze (2008) also claims that *ka-…-a* is a circumstantial modal.

quantified over is narrowed down further by what Kratzer calls a stereotypical ordering source: only those worlds are considered which are closest to 'the normal course of events' in the evaluation world. For example, it is not required that Michl is the murderer in unusual worlds where humans are routinely killed by aliens. In (36), *must* quantifies over worlds which are compatible with certain facts in the evaluation world (a circumstantial modal base), and which are closest to the ideal given by 'what the law provides' (a normative ordering source).

In recent work (Matthewson et al. 2007; Rullmann et al. 2008) we have identified two important and systematic differences between the behavior of modals in St'át'imcets and the behavior of modals in English and other well-studied European systems. Firstly, in contrast to English, the distinction between different types of conversational backgrounds is lexically marked in St'át'imcets. That is, there is a set of 'evidential' modals that allow only particular kinds of epistemic conversational backgrounds, and there is a different ('irrealis') modal that allows deontic or counterfactual, but not epistemic backgrounds. This means that *must* in (35) and (36), for example, will be translated into two different modals in St'át'imcets:

(37) *nílh=**k'a*** *s=Michl* *k'azák7-am*
FOC=**EPIS** NOM=Michl murder-MID
'Michl must be the murderer.' (In view of what is known about the crime.)

(38) *cúz'=**ka*** *n-k'a7* *kw=s=Jockl*
going.to=**IRR** LOC-jailed DET=NOM=Jockl
'Jockl must go to jail.' (In view of what the law provides.)

The second difference concerns quantificational force. In English, the quantificational force of a modal is lexically fixed: *must*, for example, is always a universal quantifier over possible worlds, and *may* is always an existential quantifier, even though their conversational backgrounds may vary. In contrast, St'át'imcets modals show variable force: the epistemic modal *k'a*, for example, can be translated as either *must*, as in (37) above, or *may*, as in (39) below; and the irrealis modal *ka* can be translated as *must*, *can*, or *may*, as in (40) below.[14]

(39) *wá7=**k'a*** *séna7* *qwenúxw*
IMPF=EPIS COUNTER sick
'He may be sick.' (Context: maybe that's why he's not here.)

14. As discussed in Rullmann et al. (2008), even though both existential and universal interpretations are available, there is a preference for default universal force for modals in St'át'imcets.

(40) *lán=lhkacw=**ka*** *áts'x-en* *ti=kwtámts-sw=a*
already=2SG.SUBJ=**IRR** see-DIR DET=husband-2SG.POSS=EXIS
'You must / can / may see your husband now.'

In Rullmann et al. (2008) we propose a unified formal analysis of the quantificational variability of Sťát'imcets modals using choice functions over possible worlds. In 5.5 below we will extend this formal analysis to *ka-…-a*. First, however, we need to discuss its modal base, since one of our principal claims here is that *ka-…-a* is lexically specified as a pure circumstantial modal.

5.2 Circumstantial modality

Pure circumstantials have a circumstantial modal base (just like deontics), but a stereotypical ordering source rather than a normative one.[15] In this section we illustrate the types of meanings we expect to find with this kind of modal.

Circumstantial conversational backgrounds are concerned with what is possible or necessary given certain facts about the way the world is. In other words, a circumstantial conversational background picks out a set of worlds in which some set of facts which hold in the evaluation world hold. As Kratzer (1991: 646) puts it:

> In using an epistemic modal, we are interested in what else may or must be the case in our world given all the evidence available. Using a circumstantial modal, we are interested in the necessities implied by or the possibilities opened up by certain sorts of facts.

Kratzer's example illustrating the contrast between epistemic and circumstantial modality is given in (41), along with her explanation below.

(41) a. *existential circumstantial:*
Hydrangeas can grow here.[16]
b. *existential epistemic:*
There might be hydrangeas growing here.

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15. Future modals are also usually assumed to have circumstantial modal bases. See Section 5.4.1 below for discussion of the close relationship between plain circumstantials and futures.

16. We prefer *could* to *can* here, as well as in (42a). This probably reflects the counterfactuality implied in the context (at least, if we know that hydrangeas are in fact *not* growing here). However, this does not affect the main point being made here. See von Fintel and Iatridou (2008) for discussion of counterfactual marking on modals.

> Suppose I acquire a piece of land in a far away country and discover that soil and climate are very much like at home, where hydrangeas prosper everywhere. Since hydrangeas are my favorite plants, I wonder whether they would grow in this place and inquire about it. The answer is [41a]. In such a situation, the proposition expressed by [41a] is true. It is true regardless of whether it is or isn't likely that there are already hydrangeas in the country we are considering. All that matters is climate, soil, the special properties of hydrangeas, and the like. Suppose now that the country we are in has never had any contacts whatsoever with Asia or America, and the vegetation is altogether different from ours. Given this evidence, my utterance of [41b] would express a false proposition. What counts here is the complete evidence available. And this evidence is not compatible with the existence of hydrangeas (Kratzer 1991: 646).

Another example illustrating the contrast between circumstantials and epistemics is given in (42).

(42) a. *existential circumstantial:*
Cathy can make a pound of cheese out of this can of milk.

b. *existential epistemic:*
Cathy might make a pound of cheese out of this can of milk.
(von Fintel & Heim 2005: 33, attributed to Angelika Kratzer)

(42a) says that it is consistent with certain facts (the size of this can of milk, Cathy's cheese-making abilities, and so on) that Cathy could make a pound of cheese out of this milk. In evaluating (42a) we do not take into account Cathy's current whereabouts or intentions, or the fact that the speaker is about to consume the can of milk before it can be made into cheese. (42b), on the other hand, claims that there is at least one possible world consistent with all the available evidence in which Cathy makes cheese out of this milk. If Cathy is 10,000 miles away at the time of utterance and the speaker is about to consume the can of milk, (42a) can be true but (42b) is false.

In the literature, various subtypes of circumstantial modality have been distinguished. Ability attributions (as in (42a)) are usually analyzed as existential circumstantial modals (e.g., Kratzer 1991; Hackl 1998, but see Bhatt 1999 for a different analysis). However, existential circumstantials need not ascribe abilities per se. Thus, in (41a) we would not say that hydrangeas 'have the ability' to grow here. Many authors make a distinction between 'dispositional' readings, which talk about the subject's abilities, desires, or dispositions, and pure circumstantials, which are not relativized to a subject. This distinction is further illustrated in (43).

(43) a. Sally can come along (because the car fits five). *pure circumstantial*
b. Sally can swim (she is able to). *dispositional circumstantial*
(Lechner 2005: 2)

We will henceforth refer to the pure circumstantial reading as the *impersonal* reading and the dispositional reading as the *personal* reading. The two readings are spelled out in (44):

(44) *Impersonal modality*: Meaning of the proposition can be calculated by considering only the facts and circumstances of the background

Personal modality: Interpretation is dependent upon properties of the subject (dispositions, abilities, desires)[17,18] (cf. Lechner 2005: 2)

So far we have only discussed circumstantial modals with existential force. Examples illustrating the circumstantial/epistemic contrast with universal modals are given in (45–46).

(45) *universal circumstantial:*
   a. Jockl must sneeze (in view of the present state of his nose, etc.).[19] (Kratzer 1991)
   b. Jockl had to sneeze.

(46) *universal epistemic:*
   a. Jockl must be sneezing (in view of the evidence available to me).
   b. Jockl must have sneezed.

(45a) asserts that in all worlds in which the actual state of Jockl's nose, Jockl's respiratory tract, and the atmospheric conditions hold, Jockl sneezes. In other words, Jockl has no choice but to sneeze. We will show below that St'át'imcets *ka-…-a* also has this kind of use.

Note, however, that in both languages, universal circumstantial modals are relatively rare, particularly in future contexts. Even in situations where the facts absolutely force something to happen, future modals are usually preferred (e.g., *The bomb will / is going to / * must explode at 6pm*). We return to this issue in 5.4.

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17. The dispositions/abilities/desires of the subject are also part of the facts and circumstances of the background, so this formulation requires some refinement.

18. Lechner argues that impersonal readings correlate with raising structures, while dispositional readings correlate with control structures (in the syntactic sense). Wurmbrand (1999) argues on the contrary that in German, Icelandic and English, all modals are raising predicates. Since *ka-…-a* does not take any kind of clausal complement, all such arguments are moot for St'át'imcets.

19. Many speakers find *must* a little odd here, although (45b) is fine. As above, we do not offer an analysis of such differences between modals in English, as they do not affect the main point.

5.3 The 'ability' interpretation of *ka-…-a* as an existential circumstantial reading

Recall that we have reduced the five interpretations associated with *ka-…-a* to two: ability and no-choice. Now, we take a closer look at the type of interpretations subsumed under ability, to convince ourselves that we are dealing with an existential circumstantial modal. Firstly, we see *ka-…-a* used for core cases of ability attributions, as in (47–48), along with their past tense versions, as in (49), which – as discussed in 4.1 above – are often translated as 'managed to'.

(47) *wá7=lhkan* *s-lheqw-mín* *ti=ts'qáx7=a,* *nilh*
IMPF=1SG.SUBJ STA-get.on.horse-RED DET=horse=EXIS FOC
kw=en=s ***ka-tsicw-aká7-min-a***
DET=1SG.POSS=NOM circ-get.there-hand-RED-**CIRC**
i=stsáqwem=a l=ki=kecmákst=a
PL.DET=saskatoon=EXIS on=PL.DET=branch=EXIS
'I was on the horse, so that I could reach the berries on the branches.'
(Matthewson 2005: 28)

(48) *wa7* *xíl-em=wit* *ets7á* *kw=s=zwat-en-ítas* *swát=as*
IMPF do-MID=3PL this DET=NOM=know-DIR-3PL.ERG who=3CONJ
ku=wá7 ***ka-xilh-tal'í-ha*** *ku=xwém*
DET=IMPF **CIRC**-do(CAUS)-TOP-**CIRC** DET=fast
'They did that to see who could do it the fastest.' (Matthewson 2005: 88)

(49) *nilh* *(s=)sek-qw-án'-itas,* *aylh* ***ka-zuqw-s-twítas-a***
FOC NOM=hit-head-DIR-3PL.ERG then **CIRC**-die-CAUS-3PL.ERG-**CIRC**
'…so they hit them on the head and managed to kill them.'
(Matthewson 2005: 144)

The ability interpretations fall squarely into the personal sub-type of circumstantial modality introduced above. However, *ka-…-a* is not restricted to personal modality interpretations: it also has impersonal readings, as illustrated in (50), where the meaning of the proposition clearly does not depend on any property of the subject.

(50) *t'áq'em'kst* *úcwalmicw* *wa7* ***ka-n-lhám'-a*** *l=ti=káoh=a*
six person IMPF **CIRC**-LOC-put.in-**CIRC** in=DET=car=EXIS
'Six people can fit in that car.'

We also see *ka-…-a* used with St'át'imcets counterparts to Kratzer's circumstantial hydrangea example:

(51) *Situation: The soil and climate are right, but the speaker knows no sagebrush actually grows here.*

wa7 ***ka****-ríp-****a*** *ku=káwkew* *kents7á*
IMPF **CIRC**-grow-**CIRC** DET=sagebrush around.here
'Sagebrush can grow around here.'

Consultant's comment: "If somebody brought some seeds it would grow here – it's just a possibility it would grow here."

(52) shows that it is not contradictory to assert that no Douglas-firs are growing here, while at the same time asserting that it is circumstantially possible that they *can* grow here.

(52) *cw7aoz* *ku=wá7* *srap-7úl* *lts7a,* *t'u7* *wa7* ***ka****-ríp-****a*** *lts7a*
NEG DET=IMPF tree-real here but IMPF **CIRC**-grow-**CIRC** here
'There are no Douglas-firs around here, but they can grow here.'

For comparison, (53) shows the epistemic half of the hydrangeas minimal pair. The consultant volunteers the epistemic modal *k'a* instead of *ka-…-a* here.

(53) *Situation: Not only are the climate and soil right, but you have reason to believe that it's actually possible there is some sagebrush growing here.*

*wá7=****k'a*** *kents7á* *sxek* *ku=káwkew*
be=**EPIS** around.here maybe DET=sagebrush
'Sagebrush might be growing around here.'

Sentence (53) is not accepted in the (51) situation. This reflects the status of *k'a* as an unambiguously epistemic modal (see Matthewson et al. 2007 for analysis). Sentence (51) *is* accepted in the (53) situation. However, this does not mean that *ka-…-a* has an epistemic reading. Rather, the situation for (53) states that the conditions for the circumstantial modal are also met in this case; hence, we would expect *ka-…-a* to be licensed in this context. More generally, if it is epistemically possible that sagebrush grows here, it will also be circumstantially possible, but not necessarily vice versa.

As a final piece of evidence that we are dealing with an existential circumstantial modal, observe that English circumstantial *can* is distinguishable from epistemic *can* in that the latter is infelicitous if the speaker is witnessing the event (see von Fintel & Gillies 2007). For example, a speaker who is looking at rain falling from the sky can felicitously utter (54a), but not (54b) (unless as a joke).

(54) a. Hmm, it can really rain hard here. CIRCUMSTANTIAL
b. Hmm, it could be raining hard here. EPISTEMIC

(55) shows that in Sťát'imcets, *ka-…-a* is good in this discourse context, while epistemic *=k'a* is not, confirming the status of *ka-…-a* as a circumstantial modal.

(55) *Situation: You are looking outside and see that it is raining really hard.*

a. *o, kéla7=t'u7 **ka**-kwís-**a** lts7a*
oh first=ADD CIRC-rain-CIRC here
'Oh, it can really rain here.'

b. **o, kela7=**k'á**=t'u7 kwis lts7a*
oh first=EPIS=ADD rain here
'Oh, it could really be raining here.'

The data in this section lead us to conclude that *ka-…-a* is used in all types of contexts that license existential circumstantial interpretations. We have not found any case of an existential circumstantial modal that cannot be rendered using *ka-…-a*.

5.4 The no-choice reading of *ka-…-a* as a universal circumstantial reading

In this section we argue that the range of uses of the no-choice reading correlate with what we expect from a universal circumstantial interpretation. Recall that the no-choice reading covers cases which translate into English as 'accidentally' (56) or 'suddenly' (57), as well as in non-controllable cases (58). Recall also that we showed that the 'suddenly' interpretation is an implicature which arises from an underlying 'accidentally' semantics.

(56) ***ka**-nk'méq'w=lhkan-**a** aylh l=ti=n-gwáts'-cal-ten=a*
CIRC-immerse=1SG.SUBJ-CIRC then in=DET=LOC-irrigate-ACT-thing=EXIS
'I fell into the ditch.' (Matthewson 2005: 158)

(57) *nilh láti7 **ka**-t'ál=s-**a** ta=káoh-s=a*
FOC there CIRC-stop=3POSS-CIRC DET=car-3POSS=EXIS
'His car suddenly stopped.' (Matthewson 2005: 230)

(58) *áts'x-en-as kw=s=plan=s wa7 **ka**-péq-**a***
see-DIR-3ERG DET=NOM=already=3POSS IMPF CIRC-white-CIRC
ti=s-7ílacw-em=a
DET-NOM-soak-MID=EXIS
'He saw that the soaked fish had turned white.' (Matthewson 2005: 153)

In Section 4.2 we argued that what these interpretations have in common is a *lack of choice* on the part of an agent. Now, if an event happens without any choice on the part of an agent, what that means is that the facts of the world conspire to make that event inevitable. Put another way, something happens with 'no choice' if it happens in all stereotypical worlds consistent with the facts. The core semantics of no-choice thus correlates with the semantics of universal circumstantials as discussed by Kratzer (1991).

5.4.1 *Universal circumstantials and the future*

In this subsection we deal with a potential problem with the claim that the no-choice interpretation of *ka-…-a* corresponds to a universal circumstantial. When St'át'imcets speakers are given St'át'imcets translations of English sentences such as (59) (=(45a)), containing universal modals with a circumstantial interpretation, they do not generally accept *ka-…-a*, as shown in (60). Instead, they offer equivalents with a plain future auxiliary or enclitic, as in (61).

(59) Jockl must sneeze (in view of the present state of his nose, etc.).

(60) *qv̓l ta=s-7exw7unám-s=a s=Gertie*
bad DET=NOM-cold-3POSS=EXIS NOM=Gertie
'Gertie has a bad cold.'

stexw wa7 n-tqép-leqs
very IMPF LOC-blocked-nose
'Her nose is really plugged up.'

#ka-nsnán7-a
CIRC-sneeze-CIRC
= 'She can sneeze.'
≠ 'She must sneeze.'

(61) *cuz' nsnána7 kw=s=Gertie*
going.to sneeze DET=NOM=Gertie
'Gertie is gonna sneeze.'

We think that what is going on here is that with eventive predicates, a universal circumstantial is very similar in its semantics to a future. What does it mean for Gertie to sneeze in every possible world consistent with the relevant facts? It means she is going to sneeze. Recall that futures have circumstantial modal bases; they thus quantify over the same kinds of modal bases as plain circumstantials do. Futures and plain circumstantials also share an ordering source, namely a stereotypical one (cf. Kratzer 1991; Copley 2002). In both the sentences *Gertie has to sneeze* and *Gertie is going to sneeze*, we quantify over all worlds where the actual world facts about Gertie's nose hold, and in which the normal course of events takes place. (For example, we do not in either case consider worlds where, one millisecond after the utterance, a nuclear attack takes place and Gertie is vaporized.) It may even be that the sentences *Gertie has to sneeze* and *Gertie is going to sneeze* differ only in that the latter explicitly specifies that the sneezing takes place after the utterance time. The simplified formulas in (62) and (63) illustrate the similarities between the two modals. (The subscript $_A$ in (62) means that we are considering only the universal interpretation of *ka-…-a* here.) Note that we will discuss the formal semantics of *ka-…-a* in more detail below, where we will revise (62). (In (63), *i* is the type of temporal intervals.)

(62) $[[ka\text{-}\ldots\text{-}a_A]]^{c,w}$ is only defined if c provides a circumstantial modal base B and a stereotypical ordering source.
If defined, $[[ka\text{-}\ldots\text{-}a_A]]^{c,w} = \lambda p_{\langle s,t\rangle}.\ \forall w'[w' \in B(w) \rightarrow p(w') = 1]$

(63) $[[cuz']]^{c,w}$ is only defined if c provides a circumstantial modal base B and a stereotypical ordering source.
If defined, $[[cuz']]^{c,w} = \lambda p_{\langle s,\langle i,t\rangle\rangle}.\ \lambda t.\ \forall w'[w' \in B(w) \rightarrow \exists t'[t<t' \ \&\ p(w')(t') = 1]]$

We thus propose that the absence of *ka-…-a* in sentences like (63) is not due to the absence of a universal circumstantial reading for *ka-…-a,* but instead reflects a temporal issue with eventive predicates. Either Gertie is already sneezing (in which case a simple present tense (imperfective) form will be used), or she is not sneezing yet but she has to sneeze. In the latter case, it follows that she is going to sneeze, and speakers prefer to use an explicit future. Of course, this does not explain the difference between St'át'imcets, where a future is required in these cases, and English, where it is not. However, as observed above, the universal circumstantial use of *must* is very restricted in English as well, being often absent when its truth conditions would be satisfied.[20]

The idea that the problem with (61) results merely from interference from the future, rather than with an absence of a universal circumstantial reading, is confirmed by the finding that when we put the same situation into the past, we *do* get *ka-…-a*, as in (64).

(64) *qvl̓ ta=s-7exw7unám-s=a s=Gertie inátcwas*
bad DET=NOM-cold-3POSS=EXIS NOM=Gertie yesterday
'Gertie had a bad cold yesterday.'

stexw wa7 ntqép-leqs
very IMPF stuck-nose
'Her nose was really plugged up.'

kens-7ílhen ku=t'éc szaq', t'u7 ***ka****-nsnán7-****a***
try-eat DET=sweet bread but CIRC-sneeze-CIRC
'She wanted to eat a cookie, but she suddenly had to sneeze.' (*volunteered gloss*)

Another past episodic case of universal *ka-…-a* is given in (65).

(65) *ka-wat'k'=kán-a i=ts'áqw-an'*=an
CIRC-vomit=1SG.SUBJ-CIRC when.PAST=eat-DIR=1SG.CNJ

ti=qvl̓-wíil'c=a ts'úqwaz'
DET=bad-become=EXIS fish

'I had to throw up after eating that rotten fish.'

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20. In English, *have to* is more commonly used in universal circumstantial contexts than *must*. We suspect that this is because *have to* favors a personal over an impersonal interpretation, which differentiates it more sharply from a plain future.

Further confirmation is provided by (present) habitual contexts, where, again, there is no interference from the future, and the universal circumstantial interpretation surfaces once more:

(66) *kán=t'u7* ***ka**-q'sán'k-**a*** *lh=en* *qan'ím-ens*
1SG.SUBJ=ADD CIRC-laugh-CIRC COMP=IMPF.1SG.CONJ hear-DIR
k=Henry *kens-7ucwalmícw-ts*
DET=Henry try-Indian-mouth
'I have to laugh when I hear Henry try to speak Indian.'

5.4.2 *Circumstantial imperatives with **ka-…-a***

In this subsection we bring one more set of facts to light, which we believe strongly support our view of *ka-…-a* as a circumstantial modal. These involve a previously unexplained use of *ka-…-a* on imperatives. Examples are given in (67), from Davis (2006: Chapter 25).

(67) a. ***ka**-xék-**a**=malh!*
CIRC-be.ruled-CIRC=ADHORT
'You better behave!'

b. ***ka**-t'íl-**a*** *láti7,* *kwís=kacw=kelh*
CIRC-be.still-CIRC there fall=2SG.SUBJ=FUT
'Stay still there, or you will fall.'

c. ***ka**-t'ek'-**a**=málh=a!*
CIRC-be.silent-CIRC=ADHORT
'Be quiet!'

Imperatives with *ka-…-a* are used when the speaker wishes to express a particularly forceful command or admonition.[21] We suggest that this is because *ka-…-a* in these cases is being used as a universal circumstantial. Literally, then (67a) expresses 'You must behave' with circumstantial 'must', similar to the use of 'must' in 'Jockl must sneeze' ((45a, 59) above). The imperative use of circumstantial modality is thus an implicature, similar to that which holds with the (future) circumstantial modal in English, as in *You will go to bed this instant!*.

The imperative use of *ka-…-a* is particularly problematic for alternative accounts (either those based on an aspectual analysis, or those taking 'control' to be an irreducible primitive: see Section 6 below). Such alternative accounts either have nothing to say about the imperative use of *ka-…-a*, or must produce ad-hoc

21. In contrast, the deontic/irrealis modal *ka* 'should, would' has weaker force than an ordinary imperative, and is used to express a less forceful injunction.

extensions to account for it. In contrast, on the modal analysis, the imperative use falls out quite naturally.

5.5 Unifying the existential and universal interpretations

We have now reduced the set of available interpretations of *ka-…-a* to two, as summarized in the table in (68).

(68)

	existential = ability	*universal = no-choice*
able to	√	
manage to	√	
accidentally		√
suddenly		√
non-controllable		√
imperative		√

The question now arises as to whether a further unification is possible. Can a semantics for *ka-…-a* be given that unifies the existential and universal interpretations, or should we simply be content with positing a lexical ambiguity?

In our previous work on other St'át'imcets modals (Matthewson et al. 2007; Rullmann et al. 2008), we have provided exactly such a unification for the existential and universal interpretations of epistemic and deontic modals. We will show in this section that this analysis can be extended quite naturally to *ka-…-a*, which has a fixed (circumstantial) modal base but variable quantificational force. Before we present and extend our general modal analysis to *ka-…-a*, however, we need to address a difference between *ka-…-a* and other modals. As we have seen, *ka-…-a* attaches to the predicate, and therefore – unlike other St'át'imcets modals – does not take scope over the entire proposition. We will therefore assume that it takes the predicate and its external argument to produce a proposition.[22] As a first pass, we give separate representations of the existential and universal interpretations of *ka-…-a* in (69–70). We are leaving the ordering source out of the truth conditions for reasons of simplicity.

(69) $[[ka\text{-}\ldots\text{-}a_E]]^{c,w}$ is only defined if c provides a circumstantial modal base B and a stereotypical ordering source.
If defined, $[[ka\text{-}\ldots\text{-}a_E]]^{c,w} = \lambda P_{\langle e,\langle s,t\rangle\rangle} . \lambda x . \exists w'[w' \in B(w) \,\&\, P(x)(w')]$

22. An anonymous reviewer asks whether the predicted scope differences between *ka-…-a* and other modals are detectable from e.g., interactions with other scope-bearing elements. At present, we do not know the answer to this question, which will have to await future work.

(70) $[[ka\text{-}\ldots\text{-}a_A]]^{c,w}$ is only defined if c provides a circumstantial modal base B and a stereotypical ordering source.
If defined, $[[ka\text{-}\ldots\text{-}a_A]]^{c,w} = \lambda P_{\langle e, \langle s,t\rangle\rangle} . \lambda x . \forall w'[w' \in B(w) \rightarrow P(x)(w')]$

In our previous work on modals in St'át'imcets, we accounted for their (apparent) quantificational variability within a unified analysis (inspired by previous work by Klinedinst 2005). The analysis utilizes a choice function over possible worlds, which selects a subset of B(w) (the set of worlds that are accessible from w). As shown in (71), where the basic schema is adapted for *ka-…-a,* the quantification is uniformly universal.

(71) $[[ka\text{-}\ldots\text{-}a]]^{c,w}$ is only defined if c provides a circumstantial modal base B and a stereotypical ordering source.
$[[ka\text{-}\ldots\text{-}a]]^{c,w} = \lambda P_{\langle e, \langle s,t\rangle\rangle} . \lambda x . \forall w'[w' \in f(B(w)) \rightarrow P(x)(w')]]$

The existential versus universal uses are then obtained by varying the size of the set of accessible worlds which are considered. If the entire set of accessible worlds constitutes the restrictor of the modal quantifier, the interpretation ends up equivalent to a universal modal. If a proper subset of accessible worlds makes up the restrictor of the modal quantifier, the interpretation is weakened to that of an existential modal. For more detailed discussion of this analysis, we refer to Rullmann et al. (2008).[23,24]

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23. An anonymous reviewer raises three interesting questions about the choice function analysis, which unfortunately go beyond the scope of the current paper (although see Rullmann et al. 2008 for more detailed discussion). The first observation is that we are using choice functions in a slightly non-standard way, in that our functions select a subset rather than an individual from a set. However, we do not believe it is a problem to use functions of this type. The reviewer's second comment concerns the functional similarity between our choice functions and the ordering source of a standard analysis. Technically, of course, the two differ in that the ordering source imposes an ordering on the set of accessible worlds, whereas the choice functions simply pick out a subset (which imposes a very trivial ordering). The question of whether the two notions could be combined is a fair one, but the answer will have to wait for future research.

Finally, the reviewer asks how exactly the context-dependence of *ka-…-a* (i.e., which interpretation will arise in any given discourse context) is captured by our formal analysis. However, we regard this as the same type of problem as the determination of the reference of deictic pronouns; formal analyses of pronouns do not spell out exactly how salience is determined by context.

24. In Rullmann et al. (2008) we show that in certain cases the choice function *f* can get existentially bound. In that paper we therefore treat *f* as a pronoun-like variable that is present in the LF representation.

6. Previous analyses

The modal analysis of *ka-…-a* presented here represents a radical departure from previous accounts. In this section, we will briefly compare our analysis to its two principal competitors: the 'control'-based account of van Eijk (1997) (6.1)[25], and the aspectual account of Demirdache (1997), Davis and Demirdache (2000), and Davis (2006) (6.2).

6.1 *Ka-…-a* as an 'out-of-control' morpheme

Van Eijk (1997) adopts the notion of (agent) control as a primitive from Thompson's (1979, 1985) work on Thompson (River) Salish (nɬéʔkepmxcín), a close relative of Stʼát'imcets within the Northern Interior subgroup of Salish. Van Eijk characterizes control as 'the degree to which a state or action is controlled by the one involved in it' (1997: 140), and claims that the underlying notion of *ka-…-a* is that of 'a lack of control: something just happens suddenly or by accident without a person controlling the event, or a person manages to achieve something' (1997: 51).

Most of the motivation for van Eijk's control-based account of *ka-…-a* comes not directly from semantics, but from a morphological co-occurrence restriction between *ka-…-a* and the directive or 'full control' transitivizer *-Vn*. (As in nearly all Salish languages, transitivity in Stʼát'mcets is formally marked by a set of transitivizing suffixes which license object agreement.) When *ka-…-a* is affixed to a verb stem which is normally transitivized by *-Vn*, the causative ('non-control') transitivizer shows up instead, as shown in the table in (72):

(72)

root	**+ *-Vn* (directive / 'full control')**	**+ *-Vn* + *ka-…-a***	**+ *-s* (causative) + *ka-…-a***
√*gwel* 'burn'	*gwél-**en*** 'burn something'	* ***ka**-gwél-**en**-a*	***ka**-gwél-**s**-a* 'set s.t. on fire, be able to burn s.t.'
√*tʼal* 'stop'	*tʼál-**an**'* 'stop something'	* ***ka**-tʼál-**an**'-a*	***ka**-tʼál-**s**-a* 'cause s.t. to stop, be able to stop s.t.'

The basic idea behind van Eijk's account of this restriction is that the directive transitivizer and *ka-…-a* have incompatible control properties: *ka-…-a* requires

25. Note that the notion of 'agent control' as employed in the literature on Salish languages bears no relation to syntactic control, as developed in the generative literature on Equi-NP deletion.

that an event be out of the agent's control, while the directive requires that it be under the agent's control. On the other hand, the causative transitivizer is specified as non-control, so it is compatible with *ka-…-a*.

Aside from the lack of a precise semantic definition of exactly what 'control' is, there are several empirical problems with this account. To start with, not every environment in which *-Vn* is replaced by *-s* can be characterized in control terms: transitives prefixed with the stative marker *(e)s-*, for example, always take the causative transitivizer, even with an agent in full control, as with predicates such as 'hold' or 'watch' (73):

(73)

root	**+ -*Vn* (DIR)**	**+ -*Vn* + *(e)s-***	**+ -*s* (CAUS) + *(e)s-***
√*teq* 'touch'	*téq-**en*** 'touch something'	* ***s**-téq-**en***	***s**-teq-**s*** 'hold something'
√*ats'x* 'see'	*áts'x-**en*** 'see something'	* ***s**-7áts'x-**en***	***s**-7áts'x-**s*** 'watch (over) something'

It might just be possible to argue, as van Eijk (1997: 126) does, that a stative predicate inherently implies lack of control, and that this explains the incompatibility of the directive transitivizer with the stative prefix. However, if so, it is hard to understand why statives can themselves be affixed with *ka-…-a*, yielding an ability reading, as in the example in (74).[26]

(74) *áy=t'u7* *kw=n=s=**ka-s**-téq-**s-a*** *ts7a*
NEG=ADD DET=1SG.POSS=NOM=**CIRC**-STA-touch-CAUS-**CIRC** this
ku=ntsqústen *qemp-7úl*
det=saucepan hot-too
'I can't hold this saucepan—it's too hot!'

A complementary problem with the control account of transitivizer alternations is posed by the fact that *-Vn* is not the only full control transitivizer in Sťát'imcets, yet it is the only one that alternates with *-s*. The 'indirective' transitivizer *-cit*, which

26. Note that van Eijk (1997: 140) explicitly denies this possibility; nevertheless, *ka-…-a* is possible with both transitive (74) and intransitive statives; an example of the latter is given in (i):

(i) *áy=t'u7* *kw=n=s=**ka-s**-tálh-lec-**a*** *múta7*
NEG=ADD DET=1SG.POSS=NOM=**CIRC-STA**-stand-AUT-**CIRC** more
'I can't stay standing up any longer!'

derives applicatives with a goal or recipient object, also entails an agent in full control of the event it denotes, yet is fully compatible with *ka-…-a*:

(75) *tsilkst s-q'ém'p-s=t'u7 ku=**ka**-nas-**ci(t)**-tsín-**a***
five NOM-ten-3POSS=ADD DET=**CIRC**-go-IND-2SG.OBJ-**CIRC**
'I can only give you fifty (dollars).'[27]

In short, the control account of transitivity alternations with *ka-…-a* is both too restricted and not restricted enough: it fails to account for transitivity alternations where control is not at issue (such as with statives), and it predicts transitivity alternations where none are found (such as in indirective contexts).[28]

Nevertheless, this is not the most serious problem with the control analysis. More telling is that it characterizes only part of the semantic range of *ka-…-a*: in particular, it does not cover the ability interpretation (which, recall, cannot be derived from the manage-to interpretation, because unlike English 'manage to', *ka-…-a* lacks an actuality entailment (4.1)).[29] Given that the ability interpretation is the least marked and most pervasive of all the interpretations of *ka-…-a,* this seems to us to constitute a fatal weakness for a control-based account.

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27. Jan van Eijk (p.c. 2007) argues that *-cit* lacks a non-control counterpart, and therefore only the control form is available with *ka-…-a*. However, in that case we would expect *ka-…-a* to be simply ungrammatical with the indirective transitivizer, contrary to fact. In order to implement van Eijk's idea, we would have to postulate a systematic ambiguity in the semantics of *-cit*, to the effect that it would be specified as non-control with *ka-…-a*, and full control without. We find such a move undesirable.

28. Of course, this still leaves open the question of how to account for the co-occurrence restriction between the directive transitivizer and *ka-…-a* – if, indeed, a synchronic account is even possible. Note that aside from *ka-…-a* and the stative prefix, the directive is also incompatible with a number of other stem-level morphemes, including the inchoative marker, -(V)C_2 reduplication, and the 'immediate' suffix *–t*: stems containing any of these morphemes must be transitivized with *-s*, though they have little in common as far as control properties are concerned. It *is* possible to characterize them all as aspectual (although in the case of *–t*, which is highly lexicalized and semantically bleached, the aspectual effect is obscure at best: see van Eijk 1997: 72); the fact that *ka-…-a* forms part of this group could then be taken as an argument that its core meaning is also aspectual, along the lines of Demirdache (1997). However, as we have argued throughout this paper, there are good reasons to choose a modal over an aspectual account of *ka-…-a*, leaving the status of these co-occurrence restrictions obscure.

29. The ability interpretation also distinguishes *ka-…-a* from 'limited control' forms in Salish (transitivizers, intransitivizers, and reflexives), which are absent in St'át'imcets except for relic forms, but widespread elsewhere in the family. These have a manage-to interpretation which entails event completion, like English 'manage to' as opposed to 'be able to' (Kiyota 2008).

6.2 *Ka-…-a* as an operator on event structure

The second previous analysis of *ka-…-a*, that of Demirdache (1997), attempts to reduce its semantics to an operation on the event structure of predicates (see also Davis & Demirdache 2000; Davis 2006). Demirdache adopts the aspectual calculus of Pustejovsky (1991, 1995), in which complex events are composed from atomic subevents consisting of states and simple transitions. Her crucial claim is that (in spite of morphological appearances) *all* eventive predicates in St'át'imcets are derived from underlyingly dyadic (causative) event structures, with both initial and final subevents. This enables her to characterize *ka-…-a* uniformly as an 'event structure passive', whose effect is to suppress either the initial subevent of a complex event, or (in the case of accomplishments) the lexical content ('the name') associated with the initial subevent.[30]

Assuming a four-way division of predicates into states, activities, achievements and accomplishments, the event-structure passive analysis of *ka-…-a* makes the following predictions for each aspectual class:

i. States should be incompatible with *ka-…-a* (they have a simplex event structure).
ii. Activities will yield a stative reading with *ka-…-a*, since suppressing their initial subevent will yield a state. According to Demirdache, this shows up as the ability interpretation.
iii. Achievements will yield an instantaneous transition ('suddenly') reading with *ka-…-a*, since their initial causing subevent is suppressed.
iv. Accomplishments will yield a non-control causative reading, whereby the association of the lexical content of the predicate with its initial subevent is suppressed.[31]

While Demirdache's account is both systematic and ingenious, it turns out that there are empirical problems with each of (i–iv). As far as (i) is concerned, the prediction is simply false: as illustrated in (74) and Footnote 27, statives are in fact compatible with *ka-…-a*. The ability of statives to co-occur with *ka-…-a,* and the

30. More accurately, it is the association of the lexical content of the root with the initial subevent that is suppressed.

31. Suppressing the initial subevent of an accomplishment, as opposed to its lexical content, will yield a simple transition, which is identical to the effect of *ka-…-a* on an achievement. Adopting the claim that all roots are lexically specified as achievements from Davis (1997), Demirdache suggests that the output of *ka-…-a* on achievements blocks the identical output on accomplishments built from achievements.

fact that the meanings of statives with and without *ka-…-a* are clearly distinct, also argues against (ii), since the meaning of 'to be able to be in state x' cannot be reduced to the meaning of 'to be in state x'.[32] As for (iii), we have already shown in 4.2 that of the two typical interpretations of achievements affixed with *ka-…-a,* 'suddenly' and 'accidentally', it is the latter which is basic, contrary to Demirdache's predictions. And finally, as far as (iv) is concerned, the non-control causative meaning is not the only one associated with *ka-…-a* on accomplishments: the ability and manage-to interpretations are if anything more prominent (see 3.1 and 3.2).

In more general terms, the event structure hypothesis is based on the idea that the various interpretations of *ka-…-a* will be restricted to particular aspectual classes. But as we have seen, this is not the case: the ability interpretation (of which the manage-to interpretation turns out to be a subtype) is clearly available for *all* event types, and the same is true for the accidentally, suddenly and non-controllable interpretations once we have unified them into a single ('no-choice') interpretation (4.2). This, of course, is exactly what is predicted by a modal analysis, which does not involve an operation on lexically specified subclasses.

7. Conclusion

In this paper, we have offered a radical reanalysis of the Sťát'imcets 'out of control' circumfix *ka-…-a* as a circumstantial modal. Our analysis remains true to van Eijk's (1997: 51) original insights about the various interpretations available for the morpheme, but departs from van Eijk's description of *ka-…-a* as fundamentally a marker of 'lack of control'. For us, the 'lack of control' aspect of *ka-…-a* is only one instantiation of its status as a circumstantial modal. The analysis presented here also contrasts significantly with the aspectual analysis of Demirdache (1997), Davis and Demirdache (2000), and Davis (2006).

In providing an analysis of *ka-…-a* as a circumstantial modal, we have also supplied independent support for a striking generalization that distinguishes the Sťát'imcets modal system from its counterparts in English and other familiar languages. English modals are lexically distinguished by quantificational force (existential versus universal) but are unselective with respect to the modal base. In contrast, as documented in Rullmann et al. (2008) and Matthewson et al. (2007), Sťát'imcets modals show the opposite profile, being unselective with respect to quantificational force but lexically encoding distinctions in the modal base

32. It is also unclear why suppressing the initial subevent of a process, which in Pustejovsky's model consists of a series of identical transitions, should yield a state rather than a transition.

(e.g., epistemic versus deontic). In the present paper, we have extended this difference to circumstantial modality, by showing that the five interpretations associated with *ka-…-a* are associated with variable quantificational force (existential for the ability and manage-to interpretations, universal for the accidentally, suddenly, and non-controllable interpretations), but involve the same (circumstantial) modal base.

Our conclusions have implications that extend well beyond the grammar of Sťát'imcets. To start with, our analysis invites comparison with control phenomena in other Salish languages, which have sometimes been regarded as comprising a unified 'control system' (see Thompson 1979, 1985). Our work suggests otherwise: it seems unlikely that the modal treatment we have given here for *ka-…-a* will extend straightforwardly to more typical transitivity-based control alternations, or indeed, to other Salish 'out-of-control' phenomena, as exemplified by –(V)C_2 reduplication (Carlson & Thompson 1982; Kinkade 1982; van Eijk 1990). A more systematic comparison is clearly warranted.

Beyond Salish, there is an intriguing resemblance between *ka-…-a* and the Austronesian 'ability/involuntary action' (AIA) marker, which exhibits a parallel cluster of interpretations (see Dell 1983/4; Kroeger 1993, and Mills 2005 on Tagalog).[33] It remains an open question how close the parallel is, and whether our modal analysis of *ka-…-a* can be extended to its Austronesian counterparts.

One way in which the interpretation of *ka-…-a* differs not only from Austronesian languages like Tagalog, but also from ability modals in more familiar Indo-European languages, is with respect to the actuality entailment of the perfective ability reading. As mentioned in Footnote 11, in both Tagalog and Malagasy, predicates in the perfective with the AIA morpheme have an entailment of culmination (Kroeger 1993; Travis 2000). And as argued by Bhatt (1999) and Hacquard (2006), existential modals in the perfective in a number of Indo-European languages (including French, Italian, Bulgarian, Greek, and Hindi) have actuality entailments like English *manage to*. In contrast, as we have seen, the manage-to interpretation of *ka-…-a* only has a cancelable actuality implicature (see 4.1 above). We do not know whether this difference is primitive, or may be derived from some other property of the languages in question; neither do we currently know of other systems with a Sťát'imcets-type actuality implicature. Clearly, further investigation is needed.

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33. See Footnote 11. Gerdts (1979), on Ilokano, appears to have been the first person to observe the parallels between Austronesian and Salish control systems; van Eijk (1997: 264, note 10) also observes that a Salish-like notion of control is an important category in Ulu Muar Malay and Javanese.

Appendix: Conversion chart from Sʔáʔimcets practical orthography to IPA

orthography	IPA	orthography	IPA	orthography	IPA
p	p	kw	k^w	h	h
pʔ	pʔ	kʔw	k'^w	w	w
m	m	c	x	wʔ	wʔ
mʔ	mʔ	cw	x^w	y	y
t	t	q	q	yʔ	yʔ
ts	ʧ, ts	qʔ	qʔ	z	z
tsʔ	cʔ	qw	q^w	zʔ	zʔ
s	ʃ, s	qʔw	q'^w	7	ʔ
n	n	x	χ	a	æ/ɛ
nʔ	nʔ	xw	$χ^w$	ao	ɑ
tʔ	ƛʔ	r	ɣ	e	ə
lh	ɬ	rʔ	ɣʔ	v	ʌ
l	l	g	ʕ	i	i
lʔ	lʔ	gʔ	ʕʔ	ii	e/ɛ
k	k	gw	$ʕ^w$	u	u
kʔ	kʔ	gʔw	$ʕ'^w$	o	o

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Modal geometry

Remarks on the structure of a modal map*

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This paper takes a closer look at the 'geometric' structure of the semantic map of modality (Van der Auwera & Plungian 1998). By analyzing the different modalities into more basic modal features, we can get a better view on how the map is organized along different dimensions around a neutral middle modality, how the deontic modality fits on the map and what role connectivity plays in defining polyfunctionality. Drawing on data from Dutch, we argue that a basic distinction on the map corresponds to the grammatical raising/control distinction.

1. Introduction: Modality's Map

A recent development in the study of modality is the use of semantic maps (van der Auwera & Plungian 1998; van der Auwera, Kehayov and Vittrant this volume). Semantic maps are used to visualize the relations between different semantic functions and the polyfunctionality of linguistic elements (Anderson 1982; Croft 2003; Haspelmath 2003; de Haan 2004, among others). An important feature of semantic maps is the notion of *contiguity* (Croft 2003). Linguistic elements can only represent a set of semantic functions that are contiguous. Consider the following hypothetical semantic map:

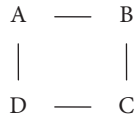


Figure 1. Hypothetical semantic map of four semantic functions

*We would like to thank the members of the Optimal Communication research group at Radboud University Nijmegen for their comments at this paper, and especially Helen de Hoop. The research for this paper was financially supported by a grant from the Netherlands Organization for Scientific Research NWO to the PIONIER project 'Case Cross-Linguistically' (number 220-70-003), which is gratefully acknowledged.

This map predicts the possible sets of functions that a linguistic element can have. Examples of these possible sets are [ADC], [BC], [ABCD], and [D]. There are two sets that are predicted to be impossible, [AC] and [BD], because neither A and C, nor B and D are connected on the map.

Semantic maps also have a diachronic aspect, although not every scholar working with semantic maps uses this aspect. The links in semantic maps represent routes along which grammaticalization can happen. Let us take the hypothetical semantic map in Figure 1 as an example again. A linguistic element on this map can for example cover only function A at one point in time, and both A and D or even only D at a later point:

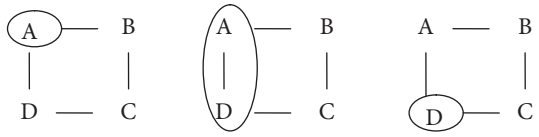


Figure 2. Possible grammaticalization route in three phases

Furthermore, the semantic map predicts that this element cannot gain function C directly from a point in time where it only has function A:

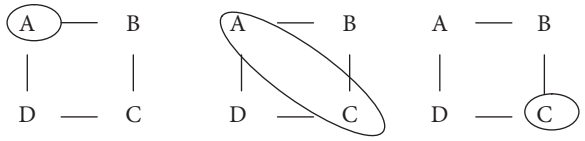


Figure 3. Impossible grammaticalization route

In some semantic maps (like the one of van der Auwera & Plungian 1998), if a grammaticalization route is attested it is represented by an arrow instead of a line between functions.

Within this general methodology of semantic mapping, van der Auwera and Plungian (1998) present the following semantic map for modality:

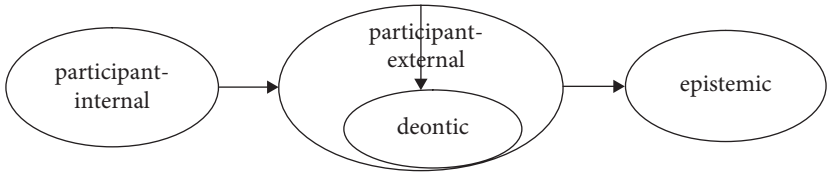


Figure 4. Van der Auwera and Plungian's (1998) semantic map of modality

They take their point of departure in the study of Bybee et al. (1994). The linguistic elements relevant to this semantic map are, mainly, modal verbs, and the semantic functions are four types of modality. These types of modality are *participant-internal*, *participant-external*, *deontic* and *epistemic* modality. Each type comes in two variants, a *strong* one (expressing necessity) and a *weak* one (expressing possibility). The following examples will feature the weak variants only. (1) is an example of participant-internal modality:

(1) John can swim

Participant-internal modality expresses the internal need/capacity of the sentence subject. With the verb *can* in (1) the ability of the subject John to swim is expressed. With participant-external modality, the locus of the possibility no longer resides in the subject of the sentence, but in the circumstances:

(2) To get to the station, John can take bus 66

Participant-external modality denotes possibilities that exist on a specific point in time. In (2) taking bus 66 is an option there for John if he wants to get to the station. The existence of this possibility does not come from John himself. Deontic modality is used whenever permission or obligation is expressed:

(3) John may stay up late

In (3) it is expressed that somebody has given permission to John to stay up late. With epistemic modality the truth of the proposition as a whole is evaluated:

(4) John may be rich

In (4) there is a proposition, *John is rich*, which may or may not be true according to the speaker. More meanings can be distinguished within these four meanings, but these are the most important ones, also for our purposes. See Bybee et al. (1994), Palmer (2001), de Haan (2005), among others, for discussion on the classification of modal meanings.

We basically agree with van der Auwera and Plungian's proposal, but in this paper we want to raise some general issues about how the structure, the 'geometry', of the modal map is defined in the first place. Essentially, we want to contrast the semantic map approach with a more classical approach in terms of semantic features. This comparison also allows us to look at some basic conceptual questions regarding modality. What kind of a priori principles do we have to structure the map for modality in a particular way, independent from the way lexical or grammatical items divide up modal meanings among themselves? More

specifically, what do we know about modal meanings that allows us to set up a map with a particular geometry? Our conceptual approach has several results. It will lead us to a revision in the structure of the map (abolishing the inclusion relation as a special relation between meanings). This has consequences for the way we look at the contiguity property. Our approach also allows us to refine the deontic part of the map, a refinement that we will try to connect to the grammatical distinction between raising and control modality. Some of our points are specific to the semantic map of modality, but we think that our analysis also has implications for the semantic map methodology in general. We assume, with the semantic map theorists, that modal words have a range of closely related meanings and that these meanings cannot always be reduced to one underspecified meaning that gets differentiated in one way or another, as in some approaches (Kratzer 1977, among others). A comparison between such monosemous approaches and the polysemous approach taken here is not in order.

The structure of the paper is as follows. First, in Section 2, we will do a rough comparison of the semantic map and the semantic map approach for modality, leaving aside deontic modality. Then we will investigate the special position of deontic modality in Section 3 and relate our findings to the difference between raising and control constructions in Section 4, using mainly data from Dutch. Finally, in Section 5, we will indicate what the consequences of our findings are for the concept of modality.

2. Global structure of the modal map

Consider the hypothetical map in Figure 1 again, repeated here as Figure 5.

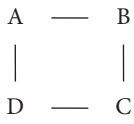


Figure 5. Hypothetical semantic map of four semantic functions

There is an alternative way to represent Figure 5, by decomposing the points of the map in terms in more basic properties or features. Suppose we have two features, let's say *P* and *Q*, corresponding to the dimensions of the map. Every point of the map is characterized by the presence (+) or absence (−) of these properties. One of the ways to do this might look as follows:

Table 1. Feature decomposition of a hypothetical semantic map

	−Q	**+Q**
−P	A	B
+P	D	C

How does the map in Figure 5 relate to this feature decomposition? We can observe that there is a line between two points if those points differ in just one feature, like A = [−P, −Q] and B = [−P, +Q].

The features can be used to define only certain sets of meaning: [BC] on the semantic map corresponds to [±P, +Q]; [ABCD] corresponds to [±P, ±Q]; and [A] to [−P, −Q]. All these sets are contiguous on the semantic map, but there are also contiguous sets that can not be defined in this way, like [ADC]. The difference between a semantic map and a semantic feature approach in this case is that the semantic map approach predicts sets of three meanings to exist (e.g. [ADC]), while the semantic feature approach predicts that these sets do not exist, since they cannot be described with a single feature combination. This difference can be a way to decide which approach is more appropriate in a particular situation: a semantic map approach might predict sets of functions that are not attested, and a semantic feature approach might fail to predict sets of functions that *are* attested.[1] On a more general level there is another difference between the two approaches. A feature approach assumes the existence of more basic properties or features, like P and Q in the above example, that define the geometry of the map. In this approach, it needs to be explained why these features should exist in the first place. The pure semantic map approach does not commit itself to these more basic attributes. Therefore, the feature approach is a more top-down approach than the map approach, starting from conceptual considerations. The map approach is more data-driven and bottom-up, making less conceptual commitments.

We would like to emphasize that our point is not that meanings on the map should receive one definitive decomposition into features that are both primitive and binary. What is important to us is that the meanings have properties and that they are related to each other because of these properties. So, we want to explore the idea that the geometry of a map could be derived from something more basic

1. On the other hand, a feature approach might face a problem of overgeneration, when it postulates a system of features that gives us feature combinations that don't correspond to actual meanings. This is where we need 'feature coocurrence restrictions' grounded in the semantic theory about the features. For example, the combination +propositional,+internal, presented below, will have to be excluded.

in the meanings. The properties might be scalar instead of binary, they might be reducible to more basic properties and one property might carry more weight than another property in defining a map. We have used a simple system with binary features here for the sake of concreteness, to give substance to the idea that meanings hang together in a particular way because of more basic properties that they have. A more sophisticated system of semantic properties might have consequences for the structure of the map.

Let us now turn to van der Auwera and Plungian's map in Figure 4 and compare the results. Their map represents two types of direct relations between meanings. Two meanings can be *adjacent* to each other, connected by an arrow (like participant-internal and participant-external) or one meaning can be *included* in another meaning (like deontic is included in participant-external). The direction of the arrow represents the direction of grammaticalization. These are two ways in which the map differs from other graph-based semantic maps (Haspelmath 2003; Croft 2003; Cysouw 2001), where non-directed lines are used between primitive meanings. Since we want to focus on the global structure of the modal map first, we will leave out the more specific deontic meaning as well as the directions on the lines, giving us the following map:

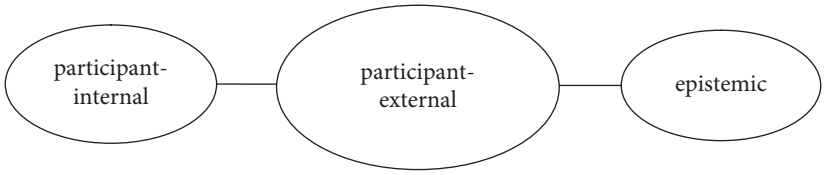


Figure 6. Modality's map without deontic modality

Why are the meanings ordered in exactly this way and not in a different way? Is there anything that we know about participant-internal, participant-external and epistemic modalities that we can use to derive or understand this structure? It is instructive to see what van der Auwera and Plungian write on this:

> Within the set of participant-internal, participant-external, and epistemic modalities, theoretically three subgroupings are possible: (i) participant-internal and participant-external modality together make up non-epistemic modality, (ii) participant-external and epistemic modality together make up non-participant-internal modality; and (iii) participant-internal and epistemic modality together make up non-participant-external modality. Only the first subgrouping makes sense, the reason being that both participant-internal and participant-external modality concern aspects internal to the state of affairs that the preposition reflects, whereas epistemic modality concerns (has scope over) the whole proposition. (van der Auwera & Plungian 1998: 81–82)

Van der Auwera and Plungian already indicate that there is an important distinction between epistemic and non-epistemic. This corresponds to other distinctions that have been made in the literature (like root modality versus epistemic modality, event modality versus propositional modality). So, there is a grouping then of the participant-internal and participant-external modality, which sets these apart from the epistemic modality. Given this grouping we can understand why there is a link between participant-internal and participant-external, because there is a kind of tree structure in which participant-internal and participant-external are closer together:

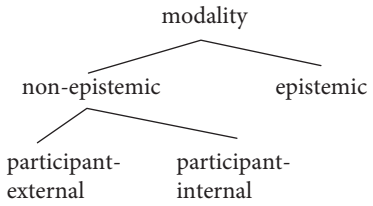


Figure 7. Epistemic - non-epistemic division

But this does not yet give us the structure of the map, because we still need to capture why participant-external is closer to epistemic than participant-internal? This does not follow the structuring in Figure 7. Van der Auwera and Plungian mention, but reject, a grouping of epistemic and participant-external as *non-participant-internal* modality. However, it is not clear on what basis this grouping can be rejected as not making sense. Any meaning that is not participant-internal must by logical necessity be non-participant-internal. So, both participant-external and epistemic are non-participant-internal: their possibility or necessity is not 'connected to a participant engaged in the state of affairs'. This leads to the following grouping:

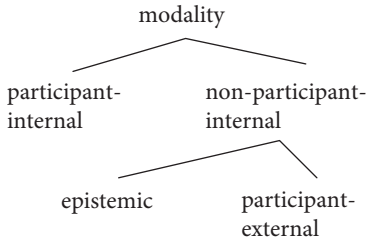


Figure 8. Internal - non-internal division

The idea is then that there are *two* dimensions of semantic features along which the three relevant modalities are distinguished, as indicated in Table 2. We use the

feature ±propositional to distinguish epistemic from non-epistemic modalities and ±internal to distinguish internal from non-internal modalities.

Table 2. Feature decomposition of modality's map minus deontic

	−propositional	**+propositional**
+internal	participant-internal	
−internal	participant-external	epistemic

This would logically lead to four distinct modalities, but the modality that is missing in van der Auwera and Plungian is a modality that is both +propositional (i.e. having scope over the whole propositional) and at the same time +internal. This fourth modality can be excluded for principled reasons: a modality cannot at the same time operate at the level of participants internal to states of affairs, and at the level of the proposition as a whole. So, we assume that participant-internal epistemic is ruled out for this reason.

We can now use the two binary features to approximate the semantic map approach to modality:

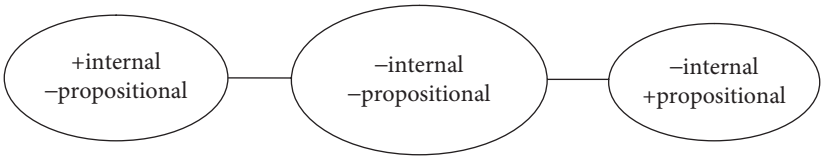


Figure 9. Feature map of modality minus deontic

Again, our point is not that modalities should necessarily be decomposed exactly in this way into binary features. Rather, given that modalities have certain properties, it is possible to define the structure of a semantic map, because the properties define how the meanings relate to each other. The line connects meanings that differ in one property or, conversely, share a property. In other words, similarity between meanings is based on what the meanings are like. Participant-external is in the middle because it shares a property with both participant-internal (being −propositional) and with epistemic (being −internal). With these three modalities of van der Auwera and Plungian sorted out, let us now turn to the fourth, deontic modality.

3. The place of deontic modality

We saw that van der Auwera and Plungian place deontic modality on the map as a *subtype* of participant-external modality. Their analysis is as follows: one way in

which the circumstances can be the source of possibility or necessity is through permissions or obligations in those circumstances. Making deontic modality a subset of participant-external modality has a number of consequences. It suggests an implicational relation between participant-external and deontic: if an expression is used for participant-external (like *can*), then the map predicts that it is also used for deontic. Note that this is a different implicational relation from the one we get from the contiguity requirement: if an expression is used for participant-internal and epistemic, then also for participant-external, the meaning in *between* these two. There are reasons to believe that the implicational relation between participant-external and deontic is not true. In Van Ostaeyen and Nuyts (2004) it is argued that in Middle Dutch, *kunnen* 'can' only had the participant-internal and participant-external functions, and not the deontic and epistemic ones. This suggests that deontic and participant-external are indeed separate modal functions. A map based on this observation would look as follows:

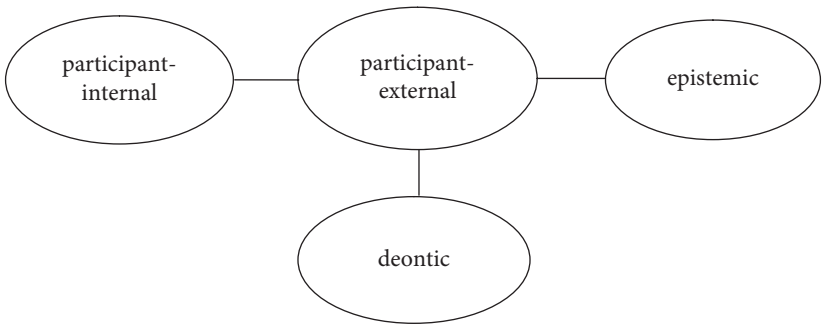


Figure 10. Semantic map of modality, including deontic

In van der Auwera, Kehayov and Vittrant (this volume) it is acknowledged that there is a participant-external modality (or, as they call it, non-deontic participant-external modality) separate from deontic modality. Yet, they still portray a "super-function" in their semantic map, which encompasses both the participant-external and the deontic function. Why is such a super-function still needed?

Van der Auwera and Plungian (1998) originally used the inclusion relation to capture the diachronic phenomena of *specialization* and *generalization*. A word can specialize from participant-external to deontic: it first used to cover the entire participant-external area and at a later stage only the deontic area. Instead of referring to external factors in general, the modal is then going to refer to those external factors that are based on authority, norms, morality. The opposite also exists: generalization from deontic to participant-external. We do not believe that the status of deontic modality and the phenomenon of specialization/generalization

need to be portrayed on the map in a special way, different from the standard relation that holds between functions. The map in Figure 10 has the advantage of just allowing one type of connection between meanings (with the additional possibility of assigning a diachronic direction to connections), just like in other semantic maps (again, see Anderson 1982; Croft 2003; Haspelmath 2003; de Haan 2004, among others). A semantic map is then, mathematically speaking, a simple *graph* of meanings. The fact that participant-external and deontic together form a modal super-function need not be separately represented on the map. It is exactly the purpose of the map to define what groupings are possible on the basis of the underlying geometry of connections. The connection between deontic participant-external and non-deontic participant-external gives us the region on the map that encompasses both these meanings. In fact, every connected subnetwork on the map is in a sense possibly such a higher-order meaning or "super-function". Specialization of meaning is also represented as a shrinking of the area covered by a particular item. Suppose that an item A first covers both participant-external and deontic and than at a later stage only deontic, then the area covered by A has shrunk and A has specialized in the deontic meaning. Again, we do not need a special relation of inclusion to capture this. We can already see this in the way the area corresponding to A has developed on the map.

Interesting in this light is a proposal by de Haan (2004) who states that a function should not be represented as a point on a semantic map, if it can be divided into more specific functions itself. In de Haan's terminology such a function is not *primitive*:

> A function X is not primitive if it can be subdivided into two (or more […]) functions that are expressed by two separate morphemes in some language. (de Haan 2004: 5)

This proposal would indeed show why a super-function of deontic and participant-external modality combined should not be allowed, but on the other hand it poses a big problem for the map in Figure 10 as well. As already noted by van der Auwera and Plungian (1998) and van der Auwera, Kehayov and Vittrant (this volume), any of the four modal functions can be divided into submeanings. Following de Haan's proposal this would mean that these submeanings are the primitives of the semantic map, and therefore that the original four meanings should no longer be represented. We agree with de Haan that scholars should try to split their functional categories into primitive functions that cannot be split up any further. However, we like to stress that in some cases it might be opportune to present a map in which the categories are not fully decomposed. In other words, we think that the map in Figure 10 is sufficient for present purposes.

We can now turn to the question what the addition of deontic modality does for our comparison between the semantic map approach and the semantic feature approach. For the feature approach we simply introduce a feature +deontic that the other modalities are obviously lacking, see Figure 11. We take the feature 'deontic' to stand for whatever semantic property is characteristic for this meaning and what distinguishes it from non-deontic meanings. This does not reveal anything new about what deontic modality is, of course, but allows us to define the way this modality fits on the map.

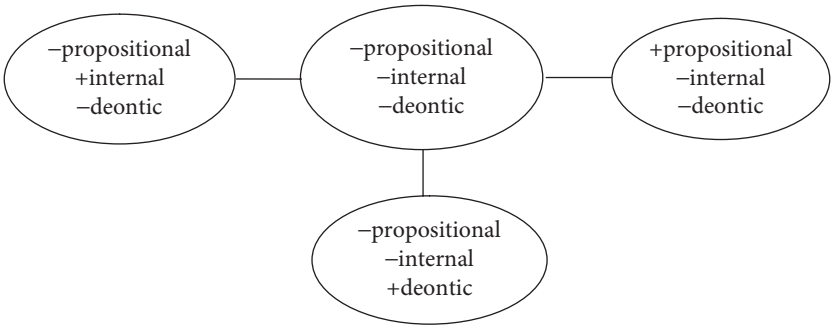


Figure 11. Feature map of modality, including deontic

This map lists four possible combinations of properties, the four original modalities. Why are the other four combinations absent? Concerning the combination with +propositional it is plausible that this feature can only combine with −internal and −deontic. A modality with the properties +internal or +deontic takes scope over a state of affairs, while a +propositional modality will take scope over entire propositions. This means that +propositional cannot combine with +internal or +deontic in the same modality. The only other possible combination, [−propositional, +internal, +deontic], cannot be dismissed on similar grounds. In the next section we will investigate if there are indeed elements with such a feature combination.

4. Raising and control and modality's map

We have seen that the primary distinctions on the semantic map concern internal and non-internal modality (±internal) and propositional and non-propositional modality (±propositional). The distinction has been made on conceptual grounds, following van der Auwera and Plungian and much earlier work. An additional

dimension was added by the deontic modality. Following van der Auwera and Plungian, we have made a four-fold distinction in modality, and described it in feature terms, namely ±internal, ±propositional, and ±deontic. Finally, the question was raised whether there exists a modality with features [+internal +deontic], since this modality could not be excluded on principled grounds.

Several scholars have distinguished a type of deontic modality that resembles these features (e.g. Barbiers 1995). The Dutch sentence in (5a) corresponds to a [+internal, +deontic] modality, while the sentence in (5b) corresponds to a sentence with [−internal, +deontic] modality:

(5) a. *Het comité mag Jan nomineren.*
the committee may John nominate
'The committee may nominate John.'

b. *Jan mag genomineerd worden.*
John may nominated become
'John may be nominated.'

In (5a) the deontic modality is internal to the subject *het comité* 'the committee', in the sense that the committee is the moral agent that receives the permission to do the action that is under its control. In (5b) the deontic modality is external to the subject *Jan*, because Jan is not in control of the action and does not receive the permission himself, but the implicit agent. We have used a passive to make this clearer here, although non-passive sentences can have this external deontic modality too.

This distinction corresponds to the grammatical distinction between *raising* and *control* verbs in generative syntactic terms. It has been assumed in the literature that verbs that select an infinitival complement must be either raising or control verbs (Chomsky 1981; Postal 1974). Raising verbs are verbs that do not assign a thematic role to their subject, see (6a) and its underlying structure in (6b):

(6) a. John seemed to like me
b. [seemed [John to like me]]

Because a finite sentence nevertheless needs a subject, *John* in (6b) is raised to the matrix subject position, as seen in (6a). Control verbs are verbs that do assign a thematic role to their subject. The infinitival complement also has a subject and this subject is the same as the matrix subject (or sometimes another argument in the matrix predicate). Therefore it is assumed that the infinitive has a PRO-element *controlled* by the matrix subject, see (7a) and (7b).

(7) a. John tried to like me
b. [John tried [PRO to like me]]

Regarding modals, it may be claimed that the modal verb in a sentence like (5a) is a control verb, while the modal verb in a sentence like (5b) is a raising verb, see Eide (2005). In other words, the difference between the two sentences is that in (5a) the matrix subject gets a special kind of theta-role from *mag* 'may' and in (5b) it does not get a theta-role. In (5a) the subject is directly granted the permission to do something, but in (5b) the derived subject is only indirectly granted such a permission, namely through the implicit agent. Following Barbiers (1995) we will call modals like the one in (5a) *directed deontic* and modals like the one in (5b) *non-directed deontic*. The role that a directed deontic assigns to a participant we will call the *grantee* role.

In the approach presented here the difference between directed deontic and non-directed deontic can be represented by the feature [± internal]: non-directed deontic is [−internal] and directed deontic is [+internal], because a participant in the states of affairs is directly involved in the modality. We would like to show that the [± internal] distinction is reflected in the grammatical raising/control distinction, not only in the [+deontic] modality but in the [−deontic] modality as well. The prediction would then be that [−deontic, −internal] modal verbs are raising verbs and that [−deontic, +internal] modal verbs are control verbs.

For epistemic modality ([−deontic, −internal, + propositional]) the claim that it involves a raising verb is undisputed. For participant-internal ([−deontic, +internal, − propositional]) and participant-external modality ([−deontic, −internal, −propositional]) the status is less clear (see Ross 1969; Pullum & Wilson 1977; Brennan 1993; Thrainsson & Vikner 1995; Wurmbrand 1999; Eide 2005; among others), but this might be because these two modalities were always lumped together. Eide (2005) cites several well-known tests for raising and control that she uses to back up the distinction between directed deontic and non-directed deontic. Let us now consider how these tests can be used to elucidate the status of participant-internal and participant-external modality in general.[2]

A first test to distinguish between raising and control is the pseudo-cleft construction, as shown in the following Dutch examples (from now on the following

2. We would like to stress that we do not expect the distinction between directed and non-directed deontic to be encoded in every language in the world, because a language can easily do without the directed deontic category (see Bhatt 1997). Our main point is that there are languages where this encoding does exist. We have left out one test that did not give clear results, the existential scope test. According to this test an indefinite subject of a control sentence always has wide scope, while an indefinite subject of a raising verb also allows narrow scope because of reconstruction. Since it was too difficult to get clear intuitions about the scope properties of subjects of modal verbs, we decided not to include this test at this stage.

abbreviation will be used: PI = participant-intenal, PE = participant-external, DD = directed deontic, NDD = non-directed deontic, E = epistemic):

(8) a. *Wat Jan probeert is (te) begrijpen hoe de oorlog*
what John tries is to understand how the war
is ontstaan. [Control]
is arisen
'John tries to understand how the war came about'

b. *Wat Jan kan is zwemmen.* [PI]
what John can is swim
'John can swim'

c. *Wat zij mogen is Jan nomineren.* [DD]
what they may is John nominate
'They may nominate John'

d. **Wat Jan kan is bus 66 nemen om bij het station te komen.*[3] [PE]
what John can is bus 66 take for near the station to come
'John can take bus 66 to get to the station'

e. **Wat Jan mag is genomineerd worden.* [NDD]
what John may is nominated become
'John may be nominated'

f. **Wat Jan kan is de trein gemist hebben.* [E]
what John can is the train missed have
'John may have missed the train'

g. **Wat Jan schijnt is een misdadiger te zijn.* [Raising]
what John seems is a criminal to be
'John seems to be a criminal'

In a pseudo-cleft construction some element of a sentence is put in focus by making it the predicate of a copula and putting the rest of the original sentence in a subject element headed by a free relative. In (9a–b), (9b) is the pseudo-cleft counterpart of (9a).

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3. An anonymous reviwer pointed out that *kunnen* (and also *mogen*) here is possible in the pseudo-cleft construction in certain special uses:

(i) *Weet je wat jij kunt/mag?? Doodvallen!!*
know you what you can/may drop.dead
'You know what you can do? Drop dead!'

To the extent that these examples represent PE or NDD meanings, they are still quite marked and possibly restricted to certain expressive contexts.

(9) a. John ate a herring.
b. [what John ate *e*] was [a herring]

With the sentences in (8a–g) the element in focus is the infinitival complement of the finite verb. This means that for (8b), for example, the structure is (10b), with (10a) being the structure of its non-pseudo-cleft counterpart.

(10) a. Jan kan zwemmen.
DP [V_{fin} VP_{nonfin}]
b. Wat Jan kan is zwemmen.
[REL DP V_{fin} *e*] COP [VP_{nonfin}]

In our free English translations the cleft is not reflected. What we see in the pseudo-cleft sentences in (8a–g) is that indeed the [–internal] modals pattern with raising verbs and the [+internal] modals pattern with control verbs. This is expected because in the pseudo-cleft construction the free relative pronoun (*wat* 'what') can be analyzed as the object of the finite verb. Because raising is not possible out of a pronoun, pseudo-cleft constructions of the kind in (10b) should be incompatible with raising verbs.

Related to the pseudo-cleft construction is the *pronoun substitution* construction. In this construction the verbal complement is substituted by demonstrative pronoun *dat* 'that', which is topicalized in these examples. There are two ways to do this, leading to a two-argument answer (that we have given first) or a one-argument answer (given between parentheses):

(11) a. *Probeert Jan te begrijpen hoe de oorlog is ontstaan?* [Control]
tries John to understand how the war is arisen
'Does John try to understand how the war came about?'
a'. *Ja, **dat** probeert hij.* (**Ja, dat probeert.*)
yes, that tries he (yes, that tries)
'Yes he does.'
b. *Kan Jan zwemmen?* [PI]
'Can John swim?'
b'. *Ja, **dat** kan hij.* (**Ja, dat kan.*)
yes, that can he (yes, that can)
'Yes he can'
c. *Mogen zij Jan nomineren?* [DD]
may they John nominate
'Are they allowed to nominate John?'
c'. *Ja, **dat** mogen zij.* (*Ja, dat mag.*)
yes, that may they (yes, that may)
'Yes they may'

d. *Kan Jan bus 66 nemen om bij het station te komen?* [PE]
can John bus 66 take for at the station to come
'Can John take bus 66 to get to the station?'

d'. *Ja, *?**dat** kan hij.* (*Ja, dat kan.*)
yes, that can he (yes, that can)
'Yes that is possible.'

e. *Mag Jan genomineerd worden?* [NDD]
may John nominated become
'May John be nominated?'

e'. *Ja, *?**dat** mag hij.* (*Ja, dat mag.*)
yes, that may he (yes, that may)
'Yes, that is allowed.'

f. *Kan Jan de trein gemist hebben?* [E]
can John the train missed have
'Is it possible that John has missed the train?'

f'. *Ja, **dat** kan hij.* (Ja, dat kan.)
yes, that can he (yes, that can)
'Yes, that is possible.'

g. *Blijkt Jan een misdadiger te zijn?* [Raising]
appears John a criminal to be
'Does John appear to be a criminal?'

g'. *Ja, **dat** blijkt hij.* (Ja, dat blijkt.)
yes, that appears he (yes, that appears)
'Yes, that appears to be the case'

For the two-argument answers, the results are essentially the same as with the pseudo-cleft construction; demonstrative *dat* replaces the predicate, which is compatible with control verbs, but not with raising verbs, because pronouns do not have subjects that can be raised. One-argument answers are okay for raising verbs, but not for control verbs because they need two arguments.

A remark is in order about the nature of the grantee role that directed deontic modals assign. Bhatt (1997) notes that in the case of deontic modality this special role does not necessarily have to be assigned to the subject or to any other argument in the sentence. In that case the subject does not receive a theta-role from the modal and is raised from the lower predicate. If sentence (12) for example is uttered to John's caretaker at the day-care, it is the caretaker that has the grantee role.

(12) John has to eat an apple today

In other words, just because there is the wish that a certain someone does a certain thing, it is not automatically so that this someone receives the responsibility for

bringing it about. Consider also the following examples, in which (b), (c), and (d) are potential answers to the question in (a):

(13) a. Jan: *Mag de kleine Tim mee naar het strand?*
may the little Tim along to the beach
John: 'May little Tim come along to the beach?'

b. Moeder: *Dat mag.*
that may
Mother: 'He may.' [permission granted to John: "You can take him with you"]

c. #Moeder: *Dat mag jij.*
that may you.

d. Moeder: *Dat mag hij.*
that may he
Mother: 'He may.' [permission transferred to Tim: "He can come if he wants"]

If the b-sentence is the answer to the a-sentence, the mother grants the responsibility over Tim to John, the addressee of the sentence. This means that in the b-sentence the verb *mogen* 'may' only needs to assign one theta-role, which goes to the situation for which permission is granted (let us say that this theta-role is a Theme role, for matters of convenience). The grantee theta-role is not specified in this context. If it would be specified (see the c-sentence) there would be a semantic clash because the subject of the answer is not the subject of the question. Instead, if *hij* 'he' is used as in the d-sentence the permission/responsibility is granted to little Tim himself, and the verb *mogen* assigns two theta-roles, one for what is allowed (going along to the beach) and one for the person who is allowed to do that (little Tim). In sum, the argument structure of a deontic modal can have the following two schematic argument structures. Non-directed deontic modals have the structure in (14a), directed deontic modals the structure in (14b).

(14) a. AUX_{deon} [$_{\text{VP}}$ DP [$_{\text{V'}}$ …]]
b. $\text{DP}_{\text{Grantee}}$ AUX_{deon} [$_{\text{VP}}$ PRO [$_{\text{V'}}$ …]]

So it seems that the grantee theta-role that deontic modals may assign to their subjects is optional: a speaker can also leave it to the context to clarify who has this role, in which case the theta-role has no syntactic status. This is in contrast with regular subject theta-roles, like the agent role with transitive verbs, which always has to be assigned. On the other hand, there are deontic modal sentences in which the subject can not get the grantee theta-role. These sentences typically include a verbal complement that is a passive or stative verb. This suggests that grantee theta-roles always correspond to an agent theta-role in the infinitival complement (but not vice versa as we have seen in example (12)).

The last test we will present is the *dummy subject* test. Control verbs are said to be incompatible with dummy subjects, because dummy subjects may not take a theta-role, and control verbs obligatory assign a theta-role to their subject. This test provides straight-forward results (cf. Hackl 1998):

(15) a. **Het probeert hier al tijden te regenen.* [Control]
it tries here already times to rain
*'It often tries to rain here'

b. **Het kan hier flink regenen.* [PI]
it can here heavily rain
*'It is able to rain heavily here'

c. **Het mag hier best eens regenen van mij.* [DD]
it may here well once rain of me
*'It is allowed to rain here as far as I'm concerned'

d. *Het kan hier flink regenen.* [PE]
it can here heavily rain
'It can rain heavily here'

e. *Het mag hier best eens regenen van mij.* [NDD]
It may here well once rain of me
'I'd like it to rain here'

f. *Het kan vanmiddag regenen.* [E]
it can this.afternoon rain
'It may rain this afternoon'

g. *Het schijnt hier regelmatig te regenen.* [Raising]
it seems here regularly to rain
'It seems to rain here regularly'

Notice that the asterisk in (15c) only applies to the interpretation where the dummy subject is granted permission directly.

The results of all the tests are summarized here in a Table:[4]

---

4. Tests with passive auxiliaries show that modals always precede the passive auxiliary. This would suggest that modals pattern with raising verbs, but on the other hand it may be the case that the passive is incompatible with a [+internal] feature:

(i) ??*Kunnen deze paddestoelen gegeten worden? Ja dat kunnen ze.*
can these mushrooms eaten become yes that can they
Intended: 'Can these mushrooms be eaten? Yes they can.'

Table 3. Raising/Control test results for modal verbs in Dutch

	Control	*PI*	*DD*	*PE*	*NDD*	*E*	Raising
Pseudo-cleft				*	*	*	*
Pronoun substitution	*	*	*				
Dummy subjects	*	*	*				

This shows how the [+internal] modalities (participant-internal and directed deontic) pattern with control verbs, which corresponds with the thematic role that these modal auxiliaries assign to the subject. The consequence is then that one half of the map (namely the [+internal] modalities) has raising properties and the other half (the [−internal] meanings) has control properties. So, the meanings on the modal map do not just correspond to words, but also to syntactic *constructions*. However, they do so in a way that crucially depends on the semantic properties of these meanings, as revealed in our sketchy analysis. Notice that the control/raising distinction is not itself part of the map, but it correlates with a modal distinction that *is* part of the map.

5. Conclusions: Connectivity and modal properties

As can be seen in Table 3 above, there are good reasons to assume the existence of two different deontic modalities, one with the attribute +internal (directed deontic) and one with the attribute −internal (non-directed deontic). If we incorporate these two different modalities in our feature structure we get the following result:

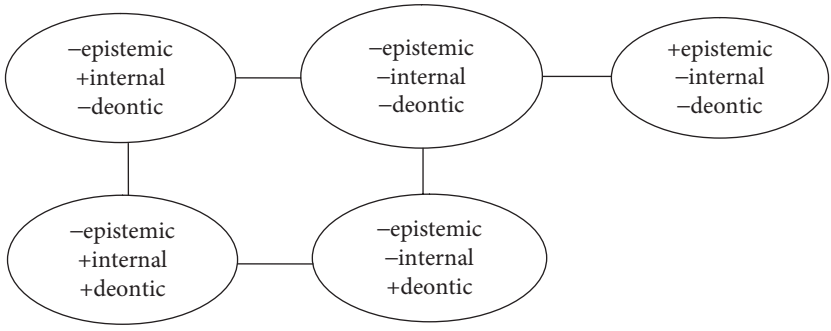


Figure 12. Feature map of modality, including two types of deontic

The semantic map counterpart of this representation would look like this:

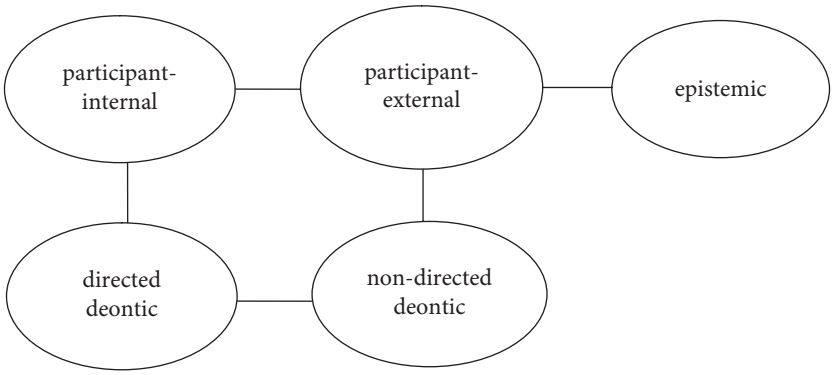


Figure 13. Semantic map of modality, including two types of deontic

These two representations may look the same, but because of their underlying principles they predict different variational patterns in languages (concerning non-epistemic modality, that is). As we stated in Section 2, the semantic map approach and the semantic feature approach differ in their predictions when four functions are ordered in a square-like fashion. The map approach predicts that a certain linguistic element can have a set of three functions out of four, while the feature approach predicts that such sets are not possible. Therefore, one way to find out which approach is right, is to look for modal elements that can express three out of four non-epistemic modalities.

A quick glance at Germanic modality suggests that it is hard to find modal elements that express three out of four non-epistemic modalities. The only modal element that might meet this definition is the Dutch verb *kunnen*. *Kunnen* has without any doubt all three [–deontic] modalities, participant-internal, participant-external, and epistemic. The deontic possibilities of *kunnen* are more marginal. Yet, a sentence like (16a) probably has a deontic interpretation.

(16) a. *Kan Jan bij ons komen wonen?*
can John by us come live
'Can John come live with us?'

b. *Ja dat kan.*
Yes that can
'Yes he can'

c. ?*Ja dat kan hij.*
Yes that can he

The sentence in (16a) can have (16b) as a possible answer, but (16c) is less acceptable. This suggests that deontic *kunnen* is better in its non-directed deontic reading, in the light of the tests of the previous sections. The answer in (16c) shows that *kunnen* with two theta-roles is less fortunate under a deontic reading, which means that directed deontic modality is less fortunate for *kunnen*. Yet, the unacceptability is not very strong, so *kunnen* is not that convincing as an example. Also, it must be said that deontic modality for *kunnen* is marginal in general (Van Ostaeyen & Nuyts 2004). More languages should be investigated to check whether Dutch *kunnen* is an anomaly or a fine example of the workings of modality.

As yet we have not found good examples of linguistic elements with three out of four non-epistemic modalities, but of course, a much wider survey of languages would be necessary to determine which of the two approaches is more adequate. In the semantic map approach, every contiguous (connected) set of nodes in Figure 13 is possible, but in the feature approach, the following sets are predicted to exist:

(17) a. the single modalities:

PI:	[−propositional, +internal, −deontic]
PE:	[−propositional, −internal, −deontic]
DD:	[−propositional, +internal, +deontic]
NDD:	[−propositional, −internal, +deontic]
E:	[+propositional, −internal, −deontic]

b. combinations of two modalities:

PE+E:	[−internal, −deontic]
PI+PE:	[−propositional, −deontic]
DD+NDD:	[−propositional, +deontic]
PE+NDD:	[−propositional, −internal]
PI+DD:	[−propositional, +internal]

c. combinations of three modalities:

PI+PE+E:	[−deontic]
PE+NDD+E:	[−internal]

d. combinations of four modalities

PI+PE+DD+NDD:	[−propositional]

e. combination of all five modalities:

PI+PE+DD+NDD+E:	[]

The number of sets here is smaller than the number of sets under a semantic map approach, because under such an approach the only criterion regarding a possible set is the notion of contiguity: all functions in a set should be connected. In fact,

the number of sets that actually appear in languages is probably even smaller than the number of sets in (18a–e) above. One aspect in this matter is that the two deontic modalities are never expressed by different elements to our knowledge. The reason for this is probably that a grantee theta-role does not have to be assigned syntactically, but can also be inferred pragmatically (Bhatt 1997). Because of this, the difference between the two deontic modalities is not that sharp.

The fact that the two modalities always go together has the effect that participant-external gets the status of central modality. If a linguistic element has a participant-internal function it can only gain the deontic functions if it first gains the participant-external function. If it directly gained the two deontic functions this could not be represented by a single valid feature combination. This is represented in the following hypothetical sequence of stages:

(18)	a.	Phase 1	functions	PI
			features	[+internal −deontic −propositional]
		Phase 2	functions	PI + DD + NDD
			features	*
	b.	Phase 1	functions	PI
			features	[+internal −deontic −propositional]
		Phase 2	functions	PI + PE
			features	[±internal −deontic −propositional]
		Phase 3	functions	PI + PE + DD + NDD
			features	[±internal ±deontic −propositional]

In (18a) the situation is represented in which a participant-internal modal element directly gains the two deontic modalities. Under the semantic feature approach it is predicted that this development can not happen, because there is no single set of features that describes the combination of PI + DD + NDD ([+internal ±deontic −propositional] describes PI + DD, and [±internal ±deontic −propositional] describes PI + PE + DD + NDD). Therefore, if the two deontic modalities are to be acquired, first the [±internal] feature must be set, which automatically leads to an additional PE meaning (18b).

Also, if there is another combination of modal meanings, the central participant-external meaning has to be part of it. If an element that has a participant-internal function gains an epistemic function, it first has to gain the participant-external function.[5] And if an element with the two deontic functions wants to gain the epistemic function (or the other way around), it first has to gain the participant-external

5. An anymous reviewer notes that a Dutch verb like *willen* 'to want'may have a participant internal and an epistemic reading, but not an participant external one. We do not think that

function. All in all it seems that participant-external modality plays a central role in the extension of modal functions.

Notice now that because of this the representation in Figure 12 gets an interesting *radial* structure. In the centre we find a kind of unmarked modality ([−propositional, −internal, −deontic]), from which more specific modalities branch out in different directions. These modalities have a clear identity: they are internal, epistemic and/or deontic. It is relatively easy to recognize these four specific modalities and to keep them apart. The modality in the middle is like an unspecified middle ground. This is where we put sentences that have a modal meaning, but without the nature of the modality being specified or being clear. Also, we suspect that an important empirical hypothesis can be brought forward about the central, unmarked modality. As far as we can see, there does not seem to be any modal expression specifically used for participant-external modality *only*. Every modal expression has to include in its meaning at least one of the four clear extremes.

We compared two ways to analyze the polyfunctionality of modal expressions (and ignored a third one in which polyfunctionality results from the interaction between a general meaning and contextual or syntactic factors). We can analyze them as regions on a semantic map of unanalyzed modal meanings with the extra constraint that these regions are connected, but we can also characterize these polyfunctional modal expressions as defined by semantic features, by particular combinations of underlying modal properties. We have indicated how these two approaches could lead to clearly different empirical results, because the semantic

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willen has an epistemic reading. Syntactically, this reading has the properties of a participant external reading:

(i) *Het kan hier geregend hebben.* [epistemic]
it can here rained have
'It may have rained here.'

(ii) ??*Het wil hier geregend hebben.*
it wants here rained have

(iii) *Het heeft hier altijd flink kunnen regenen.* [participant external]
it has here always severly can to.rain
'There has been heavy rainfall here.'

(iv) *Het heeft hier altijd flink willen regenen.*
it has here always severly want to.rain
'There has been heavy rainfall here.'

See Van Gerrevink (2008) for the nature of the modality in (iii) and (iv).

map approach allows, by its property of connectivity, for non-classical categories of meanings.

What we found is that, in the existing modal map of van der Auwera and his colleagues, there is no region that cannot be analyzed in the second, 'classical' way, namely through a combination of necessary and sufficient modal properties. Strictly speaking, when we have the features, the map of connections is not necessary to *explain* the range of modal expressions that we find. This is a somewhat disappointing result, because it means that the modal map as it stands does not really give us anything extra over and above what we already could get from a 'classical' analysis of modal expressions as 'feature sets'. The interesting thing about semantic maps is they allow us to define linguistic categories that are non-classical (i.e. cluster categories, family resemblance categories), while at the same time restricted in a non-trivial way (by the property of contiguity). However, for the map of modal meanings that we have now this cannot yet be convincingly shown.

Our purpose was not to propose the classical approach as a serious alternative to the semantic map approach to modality and show its empirical superiority by giving a range of new data. Our main point is that it is essential to think about the semantic motivations for the geometry of the modal map. Only then can we really determine what this geometry entails for the empirical range of the contiguity property. Obviously, a much deeper empirical study of modal polysemy might come up with non-classical extensions of modal expressions, showing that a classical analysis does not suffice. There are also semantic maps for other domains where a similar approach might be taken. In this way we can hope to empirically confirm the intuition that polyfunctionality in the grammar and the lexicon is constrained by the property of connectivity.

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Acquisitive modals*

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The paper explores the fact that 'get' etymons may acquire modal meanings. It tries to fit this fact into the modal map proposal of van der Auwera & Plungian (1998) and concludes that the map has to be revised, in part because the lexical input, the predicates meaning 'get/acquire', allow more than one reading, an agentive and a receptive one. The paper focuses on the two areas in which so-called 'acquisitive modality' is very prominent, viz. Northern Europe and South(east) Asia.

1. Introduction

Let an 'acquisitive modal' be an expression of modality that goes back to a predicate meaning 'acquire, get'. The phenomenon is illustrated with English (1c). Imagine a child that has got the permission of a parent to watch TV one night or, more generally, any night. The child could report on this permission with *can* or *may*, but the verb *get* is also a good option.

(1) a. I **can** watch TV tonight/at night
b. I **may** watch TV tonight/at night.
c. I **get** to watch TV tonight/at night.

*Some of the work was done by the first author when he revisited the semantic map (Kick-off meeting of CNRS Working Group on Modality, May 2004; 2nd International Conference on Modality in English, Pau September 2004). More work was done in the period that had Petar Kehayov and Alice Vittrant working in Antwerp (Winter 2005 and Spring 2006, predoc and postdoc) and Johan van der Auwera in Princeton (Winter & Spring 2007, sabbatical). For these fellowships we gratefully acknowledge the support of the Flemish and Estonian Governments (Cultural Agreement), the Flemish Fund for Research, the University of Antwerp and Princeton University. The work on Finnic was furthermore supported by a grant from the Estonian Scientific Fund. Thanks are also due to the Belgian Federal Government (Interuniversity Attraction Poles, Project P4/66). Several people are thanked in the paper, but we aditionally want to thank the anonymous referee, the initially anonymous referee Nick Enfield (Nijmegen), as well as Zlatka Guentchéva (Paris), Renzhi Li (Shantou), Quan Hai Nguen (Cantho), Alain Peyraube (Paris), Jiranthara Sriouthai (Bangkok), Ekkehard König (Berlin), Daniel Van Olmen (Antwerp), Jan-Ola Östman (Helsinki) and Masha Koptjevskaja-Tamm (Stockholm) and we want to stress our gratitude to Kasper Boye (Copenhagen).

It does not matter for our purposes whether one wants to consider the predicate *get* in (1c) to have its lexical 'get, acquire' meaning or some kind of causative or aspectual meaning and consider the possibility sense as derived from this (see Gronemeyer 1999 for a state of art synchronic and diachronic analysis of the various *get* uses). All that matters is that *get* lends itself easily to the expression of a notion of possibility, more particularly, at least in (1c), one of permission, and that it is plausible to relate this usage diachronically to a lexical verb meaning 'acquire'.

We are by no means the first to draw attention to this phenomenon. Apart from some work on English (see Gronemeyer 1999 for references, indirectly also Viberg 2002),[1] there are short typological comments by Bybee et al. (1994), van der Auwera and Plungian (1998), and Viberg (2002, 2006), there is contrastive work starting from Swedish (Wagner 1976; Viberg 2002; Ramnäs 2002, 2004, 2006; Östlund 2006), and for languages of Mainland Southeast Asia there are several papers and even an entire monograph (Enfield 2003). And yet the phenomenon is understudied. In this paper we will explore its consequences for the geometry of the semantic map of modality (van der Auwera & Plungian 1998) and we will argue that a part of the map needs to be redrawn. Given the importance of this revision and the very many interesting issues that are triggered by it (see Section 7), we think that the phenomenon deserves a term of its own and that 'acquisitive modality' does the job.[2]

Since acquisitive modals will be accommodated in a specific semantic map proposal, it is important to present the latter's relevant properties. We revisit this map, with the wisdom of hindsight, in Section 2. Section 3 discusses how the map dealt with acquisitive modality. In Section 4 we have a more detailed look at acquisitive modality, more particularly, possibility, in Northern Europe, and in Section 5 we do the same for South(east) Asia. This allows us, in Section 6, to *re*revisit the semantic map. Section 7 discusses some unexplored problems, and Section 8 is the conclusion.

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1. For English there is not much work though, and one may have the impression that the use shown in (1c) is recent. Given Gronemeyer (1999) (see also Austin 1997) this may only be an impression, but a sensible one, for this *get to* seems to allign well with Krug's (2000) "emerging" modals" (including *have to, got to*, *want to* and *need to*).

2. The term was first used in the 2004 conference presentations mentioned in note 1. Enfield 2003 uses 'ACQUIRE' for the entire network of uses found with Mainland Southeast Asian 'acquire' etymons – for the same thing Sybesma (2006) uses 'ACQ'.

2. Modality's semantic map revisited[3]

The semantic map of modality proposed by van der Auwera and Plungian (1998), henceforth 'MM', works with a relatively restricted concept of modality: modality refers only to dimensions of necessity and possibility. From this point of view, the examples in (1) are relevant, but the ones in (2) are not. (2a) concerns volition, and (2b) is arguably an expression of evidentiality. For the purposes of the map and hence also for this paper, neither volition nor evidentiality falls within the domain of modality, though they are, of course, related domains, and it is perfectly acceptable to embrace a wider notion of modality.

(2) a. I **want** to go home now.
b. He **is said** to be a hero.

MM also does not encompass what could be called 'illocutionary' modality, as with the imperative in (3) – Bybee et al. (1994) call this 'speaker-oriented modality'.

(3) Go home now.

The examples in (4) also fall outside the realm of modality.

(4) a. I **got** a TV yesterday.
b. **May** he live a hundred years!

(4a) illustrates the verb *get*, the same verb as we see in (1c), but whereas *get* is put to a modal use in (1c), in (4a) it merely carries its lexical meaning. The latter is the source of the modal use – in the terminology of MM a source meaning is called 'premodal'. The *may* of (4b) forms a nice contrast with premodal *get*; in this sentence *may* illustrates an optative use, which is considered 'postmodal', the idea being that the optative use of *may* developed out of a modal use (i.e., an expression of some of notion of possibility). The meaning is no longer modal, however: it is not enlightening to say that the *may* of (4b) expresses possibility. There is no contrast with a necessity modal, for instance, which is at least typical for English modality, nor can *may* be replaced by any other possibility modal, such as *could* or *might* – which would also be typical for English modality.

(5) * **Must/could/might** he live a hundred years!

Finally, the particular subtype of the postmodal meaning in (4b) – MM illustrates a large range of such meanings – is not modal for yet another reason: an optative marker is to be situated at the illocutionary level, just like the imperative of (3).

3. In this brief presentation we cannot claim to provide arguments or sufficient references. For these we refer to the original paper.

MM further distinguishes between four types of modality. For possibility, they are illustrated in (6).

(6) a. I **can** swim.
b. To get to the station, you **can** take bus 66.
c. You **can** stay home – you have my permission.
d. He **may** be home, or he **may** not – I don't know.

The big divide is between (6d) and (6a–c). (6d) expresses the speaker's uncertainty and it is generally called 'epistemic modality'. (6a–c) are all non-epistemic, they do not involve a possibility in the knowledge or commitment of the speaker, but rather a possibility in the states of affairs that is believed to hold. Within non-epistemic possibility, the next dividing line is between (6a) and (6b–c). In the former the possibility is internal to some participant, normally the subject of the sentence: the possibility related to swimming is this participant's ability (capacity). This is absent in (6b–c). Of course, the *you* subject still has to have the capacity to step onto a bus or stay within the confines of a home, but that is not the point. The point in (6b) is to explain part of the transportation system of a city, which is something external to the participant *you*. Similarly, the possibility in (6c) is external to the participant, in this case, we are dealing with the possibility called 'permission', and this may either come from the speaker – as in (6c) – but it may also come from a third party (rules, laws, morality). MM calls the possibility of (6a) 'participant-internal' and those of (6b–c) 'participant-external', and to distinguish between (6b) and (6c), the latter is called 'deontic' and the former 'non-deontic'.

For necessity, the classification is the same – we suffice with giving four examples.

(7) a. I **have** to have a cup of coffee, otherwise I can't function.
b. In order to get to the station, you **have** to take bus 66.
c. You **must** stay home now, and this is an order.
d. He **must** be home now; he left the office a long time ago.

MM does not claim that the classification in four subtypes cannot be made more specific: it can. For participant-internal possibility, for instance, Old English employed the ancestor of *can* for intellectual ability and the ancestor of *may* for physical ability. Another difference is that the ability could be more or less permanent. English (1a) is vague in this respect: the ability could be generic or specific to the moment of speaking, allowing sentences like (8).

(8) I **can** swim really well but I **can't** now: I hurt my knee.

Or for deontic possibility, a distinction could be made as to whether it is the speaker that authorizes the permission or not – in the first case, the deontic possibility is frequently called 'subjective' or 'performative'. There is also no claim that the distinctions are always very clear: on the contrary, they are often vague, as is made very clear in Coates (1983), the classic study of the English modals. Nor is there a claim that the distinctions make sense for every marker and every language: often deontic and non-deontic shades of participant-external modality do not attract dedicated marking. Finally, there is also no claim that the distinction between possibility and necessity is an *either-or* distinction. It is really a scale, going from impossibility over degrees of possibility to necessity, and the MM approach further allows for markers to be indeterminate about this degree. MM has examples of modal markers based on 'be', 'have' and, to wit, 'get' etymons, which do not by themselves seem to focus on any degree of possibility. (9) illustrates this with a German 'be' expression.[4]

(9) *Wesensprobleme* ***sind*** *mit den Mitteln der Ontologie zu lösen.*
problems.of.being are with the means of.the ontology to solve
'Problems of being can/must be solved with the means of ontology.'

Finally, although the examples so far have all concerned modal auxiliaries or, at least, modal verbs, the MM map is proposed for any marker, whether lexical or grammaticalized, that a language chooses to recruit in the service of modality, thus also the suffix *-ya* in Korean (10a) and, also in Korean, the syntagm 'even if VERB, it is good' ((10b)).

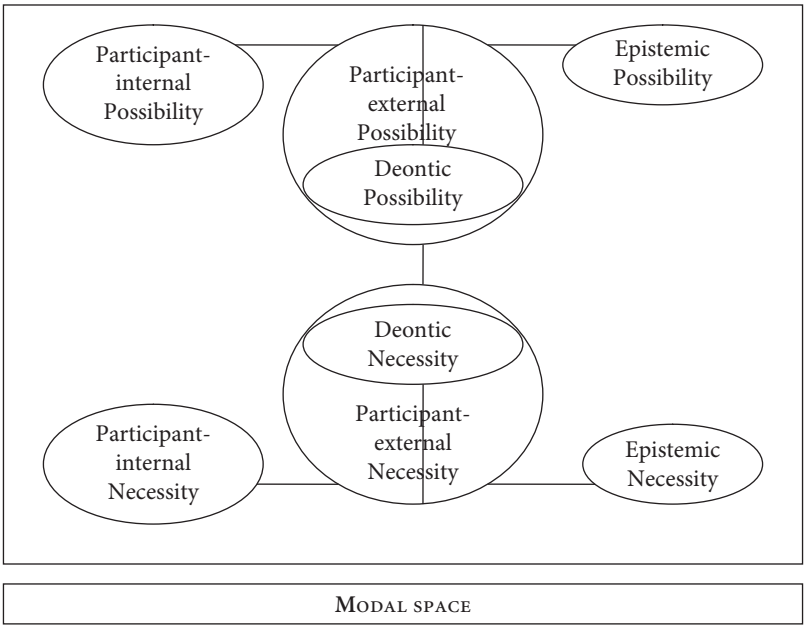
(10) Korean (Wymann 1996: 106; Sohn 1994: 348)

a. *I pyŏnci-lŭl ilk-ŏ-**ya** ha-n-ta.*
this letter-ACC read-CON-NEC do-PRS-FIN
'He has to read this letter.'

b. *Ne-nŭn ka-to coh-ta.*
you-TOP go-even good-FIN
'You can go.'

A first version of the semantic map of modality is shown as Map 1.

4. Further down (just before Map 6) we discuss cases of a possibility marker changing into a necessity marker and vice versa, and in this change there will be a stage in which a marker is vague between a possibility and a necessity reading. The case illustrated in (9) is different. The source meaning involving 'be' feeds into a meaning that has no prior possibility or necessity meaning.



Map 1. The map of modality – first version

The semantic space of modality contains eight oval shapes, each symbolizing a notion of modality. For both possibility and necessity, there are four labels, 'participant-internal', 'participant-external', 'deontic', and 'epistemic', each standing for a subtype of modality, already described and illustrated earlier. The deontic ovals are enclosed within the participant-external ovals: this symbolizes the generally accepted hypothesis that deontic modality is a subtype of participant-external modality. The complement of deontic participant-external modality is non-deontic modality, which can therefore be considered to be a fifth type, again both for possibility and necessity, and the two participant-external regions could be seen as of a bigger region, participant-external modality as such, vague between possibility and necessity – this is necessary for German (9).[5] Some of the regions are connected by lines. The vertical lines connect deontic and general participant-external modality, which again relates to the hypothesis that the former is a subtype of the latter. The horizontal lines connect participant-external modality to both participant-internal

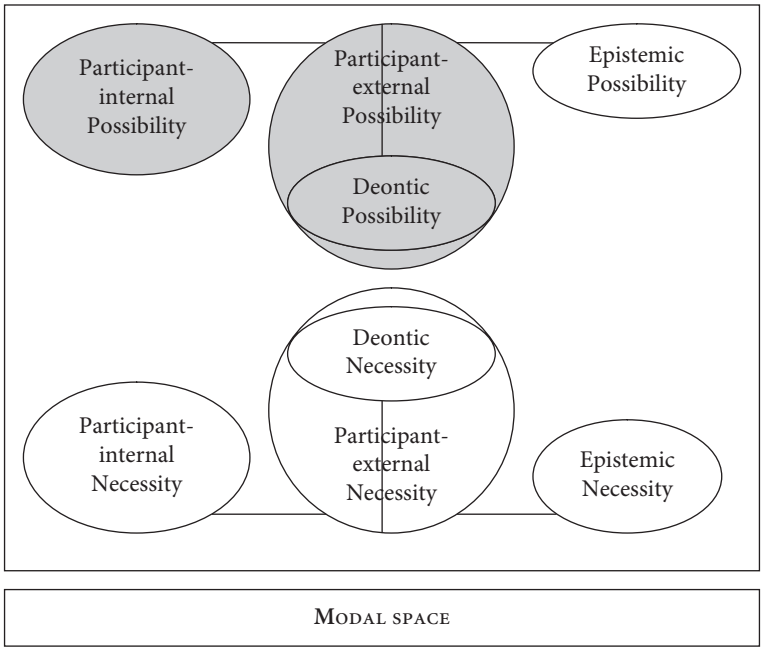
5. The non-deontic participant-external meanings are not, however, given an oval of their own, which symbolizes that we do not know of any marker that has a participant-external non-deontic meaning without also having the participant-external deontic meaning. By the same token, the complete map will give an oval to the area containing participant-external possibility and necessity.

and epistemic modality; we will call these modality types 'contiguous'. A type and subtype are also directly connected, thus participant-external possiblity and its deontic subtype are also contiguous (and there is therefore also a connecting line). Obviously, when meanings are not directly connected, they are not contiguous: epistemic possiblity is thus not contiguous with deontic possibility nor with participant-internal possibility. We thus see that the map is quite expressive. However, it also has its limitations. Most importantly perhaps, Map 1 does not show how the meanings glide into one another.

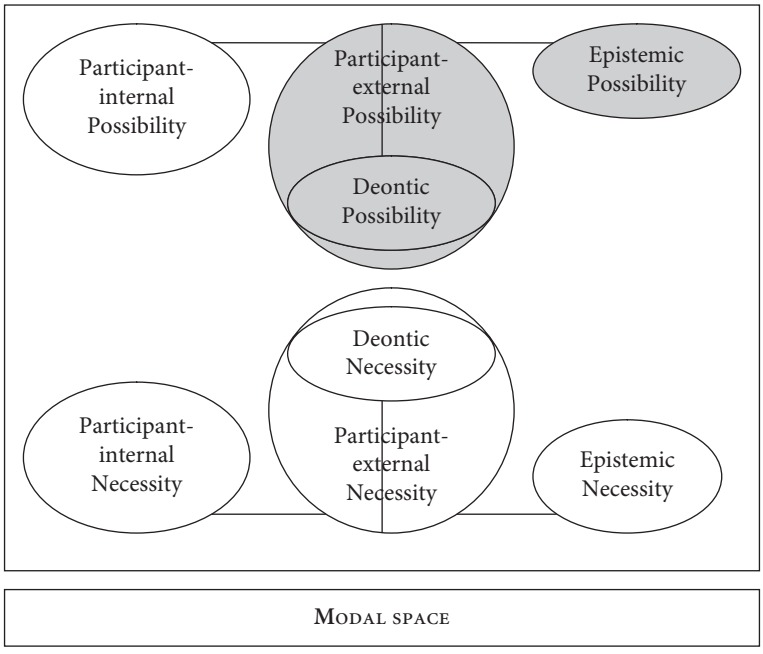
We now have a map similar in structure to the ones proposed for other domains, such as the perfect (Anderson 1982), indefiniteness (Haspelmath 1997) or semantic roles (Luraghi 2001). Like the other maps, the main goal is to account for the polysemy of constructions. Let us illustrate this with the verb *can.* Maps 2 and 3 repeat Map 1 (though, for simplicity's sake without the line connecting participant-external possibility and necessity), but they include the claim that present-day English positive declarative *can* is used for participant-internal and participant-external possibility (both deontic and non-deontic), but not for epistemic possibility, and that present-day English positive declarative *may* is used for participant-external possibility (again both deontic and non-deontic) as well as for epistemic possibility, but not for participant-internal possibility. Note also that the map is called a 'semantic map', which means that the distinctions are truly semantic, rather than pragmatic.[6]

The claim embodied in semantic maps is that polysemy results from diachrony. In other words, markers develop meanings from one another in systematic ways. These ways are indicated by the lines. But what is more, at least for some meanings we know that markers 'travel' these ways in only one direction. For the history of Enlish *may* and *can*, for instance, we know that both markers started in the participant-internal domain, then moved to participant-external modality and then, at least for *may*, to epistemic modality. And English is by no means an isolated case: Bybee et al. (1994) have shown this scenario to be a universal one. They furthermore take this development to go hand in hand with grammaticalization. Map 4 repeats most of Map 1, but it has arrows instead of lines, and the arrows are to mean that the markers historically developed their polysemy in the direction indicated by the arrow. Map 4 also added one example of a premodal and one example of a postmodal meaning. For the premodal, we have chosen the meaning of 'possession', which in many languages (e.g. English *have*) developed into a marker of participant-external

6. This is a little tricky. For any marker the map also shows its potential further development, and any further meaning will have to originate in a pragmatic extension first, i.e. in a particular 'use'. Seen from this perspective the map also shows uses, not just any uses, but pragmatically privileged ones.



Map 2. Present-day English positive declarative can

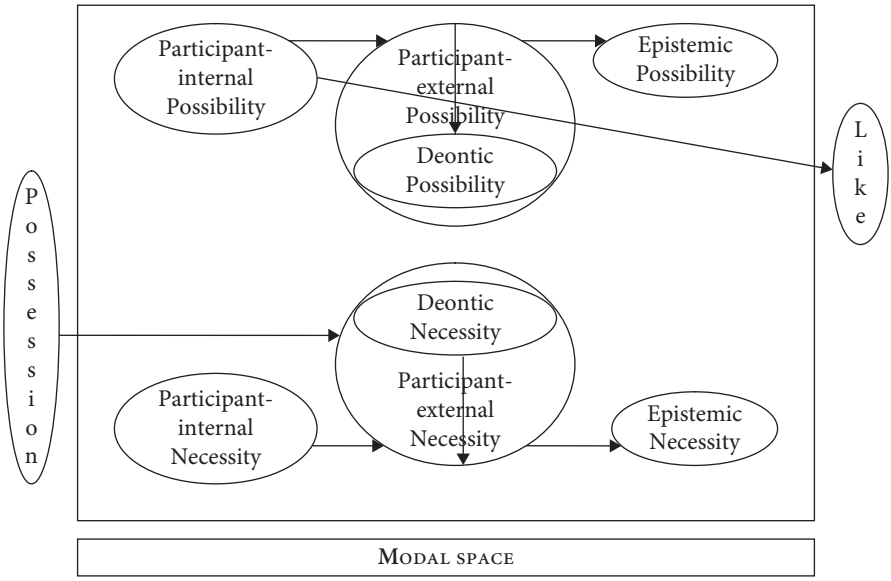


Map 3. Present-day English positive declarative may

necessity. For the postmodal, we took the 'like' meaning of Dutch *mogen* 'may', which arguably arose from the participant-internal modal use.

(11) a. I **have** two brothers.
b. I **have** to go now.

(12) Dutch
a. *Ik* ***mag*** *gaan*.
I may go
'I may go.'
b. *Ik* ***mag*** *soep*.
I may soup
'I like soup.'



Map 4. The map of modality – with some diachronic paths

The diachronization of the connections between the meanings on the semantic map does not only enrich the map, it is also useful for making precise what is one of the most important properties of semantic map, viz., the contiguity requirement. In its simplified version, it says that if a construction has two or more meanings, these meanings have to be contiguous. The underlying idea is simply that semantic similarity is reflected formally: if the form is identical, then the meanings have to be close (so that this form may be considered to be sensibly polysemous) or even identical (if one prefers a monosemy account with vagueness instead of polysemy) and any intermediate meanings should attract the same form as well. However, this simple version is *too* simple. There are enough cases in the literature in which two meanings, not

partaking in homonymy, share the same marker and an intermittent one does not. An example from the realm of modality concerns the Dutch counterpart to English *may*, viz. *mogen* (see van der Auwera 1999). Unlike *may*, *mogen* is not felicitous for non-deontic participant-external possibility nor for epistemic possibility.

(13) Dutch

a. * *Om naar het station te gaan, **mag** je bus 66 nemen.*
to to the station to go may you bus 66 take
'To get to the station, you may take bus 66.'

b. * *Hij **mag** thuis zijn, ik weet het niet.*
he may home be I know it not
'He may be home, I don't know.'

Like English *may*, *mogen* is fine for deontic participant-external possibility ((14a)) as well as for the concessive meaning ((14c)). The status of the latter is a bit unclear (see Souesme 2009), but it may be either a subtype of (what then becomes 'general') epistemic possibility or a further development. For our purpose, the exact status does not matter and we take it as a subtype of epistemic possibility. *mogen* also has the optative meaning ((14b)), which we take to be a postmodal meaning deriving from general participant-external possibility.

(14) Dutch

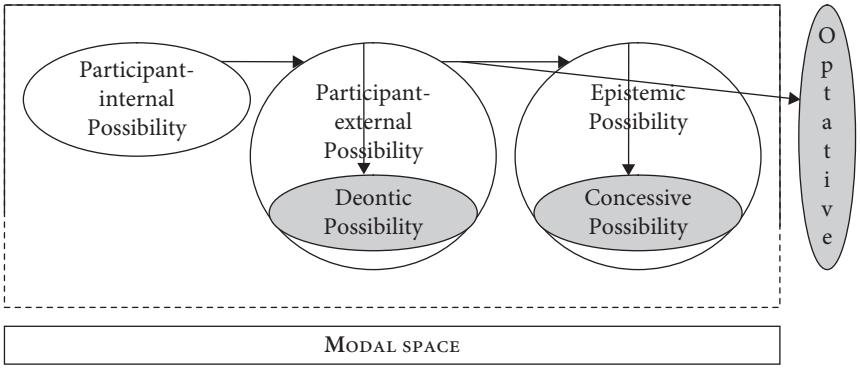
a. *Ik **mag** gaan.*
I may go
'I may go.'

b. ***Moge** hij honderd jaar leven!*
may he hundred year live
'May he live a hundred years!'

c. *Hij **mag** slim zijn, sympathiek is hij niet.*
he may clever be nice is he not
'He may be clever, but he is not nice.'

Map 5 shows that the three meanings covered by Dutch *mogen* are not contiguous. But at least there was a historical contiguity in that they share some of their ancestors. The optative and the deontic possibility are one step removed from general participant-external possibility and the concessive subtype is two steps removed from it. Thus MM formulated a more refined contiguity requirement: meanings covered by a marker have to be contiguous or go back to a common ancestor.

The last general point that is relevant for acquisitive modality concerns the directionality of the semantic change symbolized by the arrows. So far all the arrows have been unidirectional, and this is indeed a property of most of the changes described in MM, but not of all. Interestingly, the only changes found in the data covered by MM are changes between possibility and necessity. Thus we know that



Map 5. Present-day Dutch mogen 'may'[7]

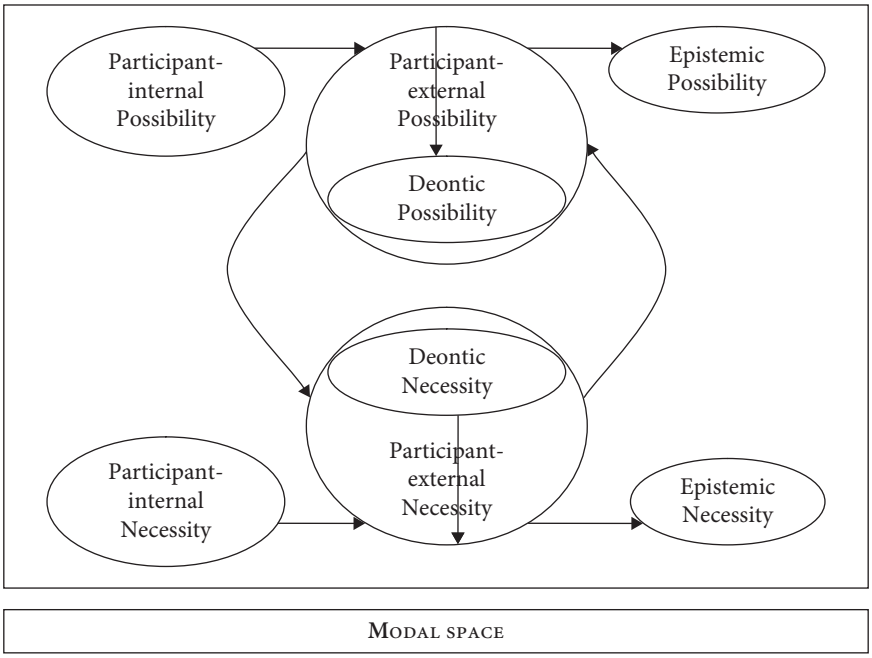
English *must* and its cognates in other Germanic languages started out as markers of possibility and that they are now necessity markers or they are in the process of becoming necessity markers (Danish) – an intermediate situation calling for the same type of analysis as German (9). This process may happen to *may* and its cognates as well. What we need is that a necessity implicature conventionalizes, such as the implicature in English (15), uttered by a general to a corporal, or the one in Dutch (16), uttered in a context where the husband hates cooking (observation due to Gronemeyer 2001: 6)

(15) You **may** go now.
implicature: 'You must go now.'

(16) Dutch
Jullie ma is niet thuis. Dus ***mag*** *ik weer koken.*
your mom is not home. so may I again cook
implicature: 'Your mom isn't home. So I must cook again.'

And then there is at least one attested change in the opposite direction, viz. that of German *dürfen.* Both the change from necessity to possibility and that from possibility to necessity arguably happened in the participant-external domain (perhaps more specifically in the deontic subdomain). Map 6 represents these facts with two arrows, connecting participant-external possibility and participant-external necessity.

7. This map, and a few more later, only shows the top part of the modal map. The incompleteness is symbolized by the dotted lines.



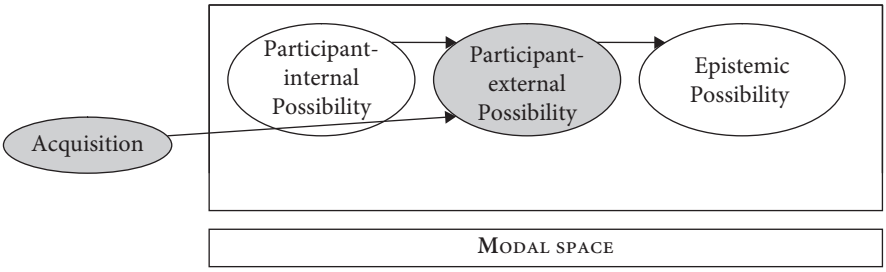
Map 6. The bidirectionality in the participant-external domain

3. Acquisitive possibility in MM

The problem posed by acquisitive modals concerns the relation between participant-internal and participant-external possibility. As mentioned already, MM accepted and confirmed the universalist hypothesis in Bybee et al. (1994) that the directionality goes from participant-internal to participant-external modality. Of course, a marker for participant-external possibility need not come from participant-internal possibility: as the case of *dürfen* shows, it may also come from participant-external necessity or directly from the premodal domain (see the arrow from possession on Map 4). The latter kind of path was posited for the acquisitive modality of *get*, illustrated in (1c) and repeated below as (17) (MM 104).

(17) I **get** to watch TV tonight.

Map 7 shows the connection between premodal 'acquisition' and participant-external possibility. For the sake of simplicity Map 7 – and all further maps – does not separate out the deontic subtype anymore.



Map 7. From acquisition to participant-external possibility

With respect to the hypothesis that the link between participant-internal and participant-external possibility is unidirectional from internal to external, the facts of English seemed most welcome, for English *get* cannot express capacity, as illustrated in (18).

(18) * I **get** to swim.
'I know how to swim.'

As MM (104) mentioned, the modal extension of a 'get' verb is not restricted to English. The following languages were listed (MM 104, 119): Swedish (Wagner 1976), the Tibeto-Burman language Lahu (Matisoff 1973: 233, 551, 1991: 419; also mentioned in Bybee et al. 1994: 191), and Hindi-Urdu as well as Bangla (van der Auwera 2001a); MM (119) further referred to Matisoff (1991: 419–425) and Li (1991) as documenting Southeast Asian languages other than Lahu. The unidirectionality thesis was not focussed upon by MM and was allowed to stand.[8] MM briefly alluded to two interesting phenomena. First, it was pointed out that the Swedish 'get' verb *få* allows both what was called a 'participant-external actuality' and a 'participant-internal actuality' sense. The former sense is illustrated with English (19).

(19) John **got** to know the whole truth.

The state of affairs of the complement clause is realized. The subject John had no active role, he was a recipient only, and the truth was imparted to him from a

8. Interestingly, Heine and Kuteva (2002: 143–9), who were aware of very much the same literature as MM – though they were not aware of MM – implicitly also maintained the unidirectionality hypothesis.

source that was external to him. With respect other activities, however, the subject must be assumed to play a more active role, as in English (20).

(20) John **got** to learn Japanese.

The actuality here is no doubt also due to favorable external circumstances, such as the good teacher or teaching method or the fact that John was immersed in a Japanese environment, but John's brilliance, energy and concentration will have had a role too. There is therefore a stronger participant-internal component to it, such that *get* here comes closer to *manage*. The relevance of this is that we see that in the right context the actuality may be participant-internal. If this can happen with actuality readings, why can't it happen with possibility readings? This would then allow (18) and *get* could mean 'be able to'.

Interestingly – and what follows is a new remark, absent in MM – English 'get' has other uses, some of which are in fact participant-internal. Consider the purely lexical use in (21).

(21) John **got** a book.

It is possible that John was a recipient who only had to open his hands but it is no less possible that he snatched it way from someone else. In the latter sense, *get* allows an imperative, which is not available for verbs like *receive* and *acquire*.

(22) **Get**/*receive/*acquire a book.

This more agentive reading is actually possible for (1c) also. What MM had in mind was only the participant-external reading, which involves a TV watching opportunity 'befalling' upon the subject, but there is a participant-internal reading in which the subject secured himself/herself of this opportunity. Should this be the first usage, then this is relevant for the unidirectionality hypothesis, because we would then have to allow acquisition to directly feed into at least a subtype of participant-internal possibility. But we don't know this. Gronemeyer (1999: 30–2, 35) actually claims that what she calls 'permissive' *get* derives from 'causative' *get,* illustrated in (23), a use which definitely refers to a participant-internal, causative force.

(23) John **got** me to clean his car.

This is not very plausible, though. Gronemeyer (1999: 31) refers to the cross-linguistic fact that causative markers often also have permissive uses, but this is irrelevant here, because it would predict that the causative sense of 'somebody caused something' would spawn 'somebody permitted something', but the resultant meaning, in English (1c), is 'somebody was permitted something'.

The second fact briefly alluded to in MM (119) was that the Sino-Tibetan language Lahu, as described by Matisoff (1973: 551), had a modal that would have clear

participant-external as well participant-internal possibility readings. MM assumed that the participant-external reading came first, and therefore the facts of Lahu could be problematic. However, Lahu did not after all worry the authors of MM: they were put at ease by Matisoff's (1973: 551) hunch that this extension was due to language contact, more particularly, to interference from the Tai-Kadai language Shan. Thus the unidirectionality thesis was saved, for language interference need not follow semantic paths, it has a sociolinguistic motivation, not a semantic one.

MM appeared in 1998. It is now – ten years later – clear that Lahu, with an acquisitive modal allowing both participant-external and participant-internal readings is not an isolated case. In Southeast Asia, Lahu will be shown to be one of many such languages. And we also find them in the general area where we find Swedish, i.e. Northern Europe. We will first have a closer look at Northern Europe.

4. Acquisitive possibility in Northern Europe

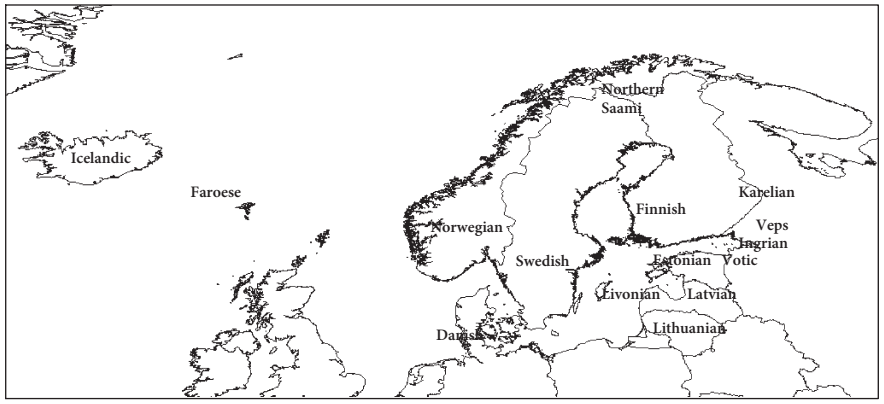
In Northern Europe, we find acquisitive modality in three families, North Germanic, Finno-Lappic (comprising Finnic and Saami) and Baltic. We have synchronic data for the languages listed in Table 1. Map 8 shows where they are spoken.

Table 1. Languages of Northern Europe: acquisitive possibility markers and sources

Family	Languages	Verbs	Sources
North Germanic	Icelandic	*geta*	Thráinsson & Vikner 1995: 57, 85
	Faroese	–	Thráinsson & Petersen 2004
	Danish*	*(få)*	Kasper Boye (Copenhagen) p.c.
	Norwegian	*få*	Eide 2005: 75–7
	Swedish	*få*	Wagner 1976; Viberg 2002
Finno-Lappic**	Northern Saami	*oažžut*	Koskinen 1998: 134–139
	Finnish	*saada*	Kangasniemi 1992: 321–329 among others
	Karelian	*soaha*	Pekka Zaikov (Petrozavodsk), Anastassia Trifonova (Tartu), Maria Peleshenko (Tartu) p.c.
	Veps	*sada*	Deniss Kavinov (Tartu) p.c.
	Ingrian	*sāvva*	Eeva Saar (Tartu) p.c.
	Votic	*sāvva*	Heinsoo 1990
	Estonian	*saama*	Erelt 2003: 106–107 among others
	Livonian	*sōdə*	Tiit-Rein Viitso (Tartu) p.c.
Baltic	Latvian	*(dabūt)*	Ilze Zagorska (Tartu) p.c.
	Lithuanian	*(gauti)*	Aurelia Usoniene (Vilnius) p.c.

* The brackets indicate that the meaning is marginal. Danish also has *gide*, which is interesting too, though it is not strictly speaking 'modal', in the restrictive sense used in this paper. It will be discussed later in this section.

** For all of the Finnic languages (Finnish, Karelian, Veps, Ingrian, Votic, Estonian and Livonian) we also consulted grammar descriptions, text collections and dictionaries. See Kehayov and Torn (2006) for details.



Map 8. Languages of Northern Europe

Table 2 gives an overview of participant-internal and participant-external possibility meanings.

Table 2. Acquisitive possibility modals in the languages of Northern Europe

Possibility Languages		Participant-external	Participant-internal
North Germanic Finno-Lappic Baltic	Danish, Norwegian, Swedish Finnish, Veps Lithuanian	+	–
North Germanic Finno-Lappic Baltic	Icelandic Northern Saami, Estonian, Ingrian, Livonian, Karelian, Votic Latvian	+	+
North Germanic	Faroese	–	–
No language		–	+

It is clear that Northern Europe does not only have Swedish as a language that has exploited 'get' for the purposes of expressing participant-external possibility. (24a–b) illustrates the participant-external meanings for Estonian *saama*.

(24) Estonian (p.k., Erelt 2003: 107)

a. ***Saa-b*** *ujuma minna kui ilma-d on ilusa-d.*
get-PRS.3SG swim.INF go.INF when weather-PL be.PRS.3SG beautiful-PL
'It is possible (for us) to go swimming when the weather is better.'

b. *Kaasa* ***saa-b*** *võtta 10 kroon-i.*
with get-PRS.3SG take.INF 10 crown-PRT
'One is allowed to take 10 crowns along.'

Most interestingly, for the purpose of judging the directionality link between participant-external and participant-internal possibility, each family has at least one language that uses its 'get' lexeme for both participant-external and participant-internal possibility. This is again illustrated with Estonian.

(24) Estonian (Erelt 2003: 107)

c. *Sina* ***saa-d*** *mind aidata.*
you get-PRS.3SG me help.INF
'You can help me.'

All by itself (24c) is vague between a participant-external and a participant-internal reading. In the intended reading (24c) can be paraphrased as 'You are the kind of person that can help me' or 'You have all the qualities necessary for helping me'. These paraphrases make clear that the potentiality first and foremost resides in the *you* participant and that the characterization in terms of 'participant-internal possibility' is appropriate. (25) is another example, showing that participant-internal possibility may involve both a more permanent skill and a time-restricted ability (like Example (8) for English).

(25) Estonian (p.k.)

Tavaliselt ma ***saa-n*** *nõu-sid pesta, aga*
normally I get-PRS.1SG dish-PL.PRT wash.INF but
praegu ei ***saa****, sest mu käed valuta-vad.*
now NEGV get because my hands hurt-PRS.3PL
'I can normally wash the dishes, but now I cannot wash them, because my hands hurt.'

Note that the claim that *saama* expresses participant-internal possibility does not mean that *saama* can cover all of the participant-internal possibility. For at least mental capacity, Estonian will use a verb *oskama* 'know how to'. Thráinsson and Vikner (1995: 85) make a similar remark about Icelandic, although the parameters are said to be different: *geta* is temporary and *kunna* 'permanent'. Just how the participant-internal domain is carved up depends on the availability of other modal verbs, and we have not studied this. But the facts of Estonian and Icelandic may well be generalizable. Obviously, modal verbs often come from expressions of might and knowledge, both of them states, and hence more permanent. If either or both yields a modal, and an acquisitive is there as well, then the former will associate with the specifically physical and intellectual and/or permanent ability.

The next thing to note about Table 2 is that Northern Europe has no language that uses 'get' only for participant-internal possibility. Thus at least in Northern Europe participant-internal uses are acceptable only for languages that also have participant-external uses. This synchronic observation is compatible with the idea

that a language first has to have the participant-external use, and that it may or may not develop the participant-internal use. But it is no less compatible with the idea that the original meaning was in fact the participant-internal one or perhaps a subtype, which then simply disappeared in all these languages, just like the participant-internal sense of *may* disappeared in English. It is nevertheless a little suspicious that there is not a single language that has kept the supposedly original participant-internal use as its only use. Essentially though, we need detailed historical work to answer the question about the direction of the development, which at least for some of the languages can be done or has in fact already been done. That the idea of the participant-internal use coming first is not to be ruled out comes from the story of the Danish acquisitive non-modal *gide*. This verb now means 'bother, be inclined to, feel like', a usage that is similar to the one illustrated with Dutch (12b).

(26) Danish (Brandt 1999: 48)

Jeg ***gider*** *ikke læse lingvistik idag.*
I bother not read linguistics today
'I don't bother to read linguistics today.'

The present-day sense is clearly participant-internal (cf. Boye (2001: 56), who uses the analogous term 'agonist-internal'), and its ancestor is the 'get' verb that still survives in Icelandic. It earlier also had a possibility sense and the extant literature (Skautrup 1944–70, Vol 2: 249; Hansen 1977) strongly suggests that its early possibility use was participant-internal. Here then it was a 'get' verb that never developed a participant-external possibility sense and later even dropped the participant-internal possibility sense, leaving only the non-modal – and postmodal – participant-internal sense illustrated in (26). Of course, this history of one Danish verb does not tell us anything about the histories of the unrelated Finno-Lappic and Baltic etymons.

Note that the histories of the Northern European 'get' etymons will also involve language contact. The area includes the Circum-Baltic region, which is characterized by intensive micro-level contact interference, as made clear in Dahl and Koptjevskaja-Tamm (2001). Interestingly, though Dahl and Koptjevskaja-Tamm (2001) is the state of the art report of grammatical interference in the Baltic, acquisitive possibility is not mentioned. But we are aware of one claim relevant to Circum-Baltic acquisitive modality. On the basis of the nearly complete isomorphism between the auxiliary uses of Swedish *få* and Finnish *saada* and the fact that during many centuries it is Finnish that copied Swedish, Raukko and Östman (1994: 53) suggest that Swedish *få* served as the model for Finnish *saada*.[9] This

9. Viberg (2002: 127, 147; 2006: 125; see also Koptjevskaja-Tamm in print) also notes the correspondence between Swedish and Finnish, and further remarks that despite the similar polysemies of the respective verbs, their current mutural translatibility is actually rather low.

is a sensible hypothesis, but we need direct historical work, of course. At least, in North Germanic acquisitive modality is old. It was there since Old Norse, and even with two etymons: (i) *geta* (Zoëga 2004: lemma *geta*; Faarlund 2004: 130–131), the direct counterpart to English *get*, which survives in Icelandic until this day (and in Danish *gide*) and (ii) *fá* (Zoëga 2004: lemma *fá*), the etymon that survives in Swedish and Norwegian (and marginally also in Danish). One might also venture a comment on the role of contact in Latvian and Lithuanian. In these languages, the uses are more marginal and not standard. For Latvian, an influence from Finnic is not excluded, but then (Low) German (Axel Holvoet p.c.) could have been important, too. To judge from present-day uses, German *bekommen* 'get' and *kriegen* 'get' – as well as Dutch *krijgen* 'get' – these languages could be credited with marginal acquisitive modality as well.[10] At least with transitive verbs, these three verbs allow participant-external possibility readings.[11]

(27) German/Dutch (p.k.)

Ich	***bekomme/kriege***	*einen*	*Film*	*zu*	*sehen.*
Ik	***krijg***	*een*	*film*	*te*	*zien.*
I	get	a	film	to	see

'I get to watch a film.'

Different from the 'get' uses in the other languages, however, intransitive verb complements are bad.

(28) German/Dutch (p.k.)

* *Ich*	***bekomme/kriege***	*zu*	*gehen.*
* *Ik*	***krijg***	*te*	*gaan.*
I	get	to	go

'I get to go.'

Of further notice is that the Latvian etymon probably is not even native: it is most likely a loan from Russian (Karulis 2001: 194). That in itself does not tell us about the meanings that were calqued, of course, and they probably were not the interesting ones, for the source language is Russian. An even better illustration of the need of making a distinction between the origin of a form and its meaning comes from English: English *get* is actually a loan and even from the Scandinavian hotbed of acquisitive modality (*MED,* lemma *geten*). But this is indeed irrelevant for its modal history, for the form was borrowed in Middle English, and the first

10. If we are allowed to add German then we get an areal feature that goes around the entire Baltic, even though it misses out on Slavic and it extends to English, Dutch, and Icelandic.

11. Depending on what is received (whether it is a film or a task, for instance), necessity readings are also allowed. This is discussed in Section 7.

instances of modal *get* are found only in the 17th c. (*OED*, lemma *get*; Gronemeyer 1999: 30–1, 36).

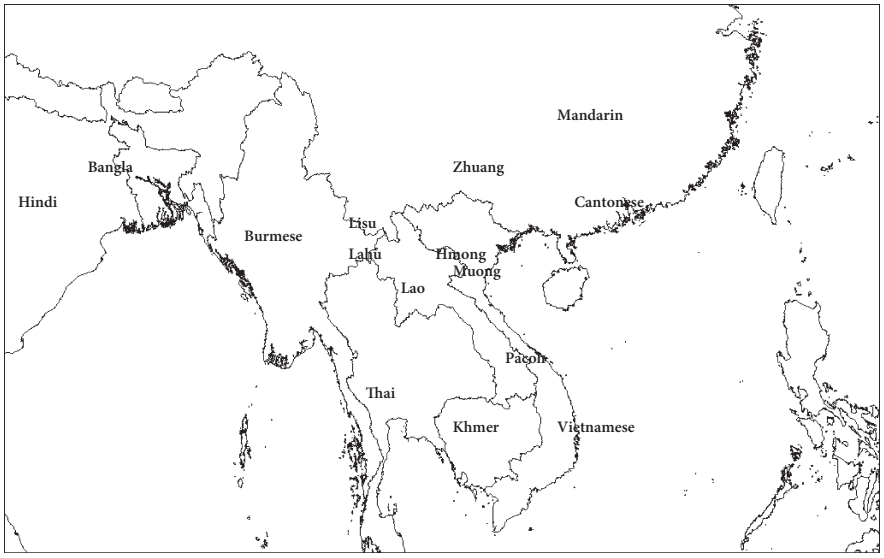
5. Acquisitive possibility in South(east) Asia

The second hotbed of acquisitive possibility is South to Southeast Asia. This much was clear already since Matisoff (1991: 419–425) and Li (1991), but the topic has seen an entire monograph devoted to in Enfield (2003), at least for Southeast Asia (see also Enfield 2001a, 2001b, 2004). The languages reported on are listed in Table 3. Matisoff (1991: 419–425) and Enfield (2003: 320–350) contains information on many other languages, as well, but it often does not suffice to decide which if any of the relevant possibility meanings the relevant markers cover. We will later also mention some facts of the Chinese dialect Xiang (based on Wu 2005) and of Tai Kadaic Nung (based on Saul & Wilson 1980).

Table 3. South and Southeast Asian languages, acquisitive modals, and sources

Family	Languages	Verbs	Sources
Indo-Aryan	Hindi, Bangla	pa-	van der Auwera 1999
Sino-Tibetan	Burmese	ya'	Vittrant 2004: 311–7
	Lahu	ga	Matisoff 1973; Matisoff 1991: 419 Bradley 2003: 231
	Lisu	wa̲^{44}	
	Mandarin*	(de/dé)	Sun 1996: 129–38; Enfield 2003: 196–7; Li 2004: 158–60
	Cantonese	dak	Matthews & Yip 1994: 242–4; Enfield 2003: 197; Cheng & Sybesma 2004
Mon-Khmer	Khmer	baan	Matisoff 1991: 425–6; Haiman 1999; Enfield 2003: 189–92
	Vietnamese	được	Matisoff 1991: 422–5; Enfield 2003: 202–3; Nguyen 2006
	Muong	an^{3}	Enfield 2003: 333–6
	Pacoh	boon	Enfield 2003: 243–6
Hmong-Mien	Hmong	tau/taus	Matisoff 1991: 421–2; Enfield 2003: 194–5
Tai-Kadai	Lao	daj^{4}	Enfield 2003: 75–162
	Thai	dây	Iwasaki & Ingkaphirom 2005: 350–5; Srioutai 2006
	Zhuang	ndaej	Sybesma 2006

* All the work reported on here relating to Mandarin concentrates on *de/dé,* but Peyraube (1999: 35) argues that Archaic Chinese had two acquisitive modals, the other being *huo*. There is also a form *děi*, which expresses necessity. We come to that in Section 7. The brackets indicate that the construction is marginal.



Map 9. Languages of South(east) Asia

Table 4 gives an overview of participant-internal and participant-external meanings.

Table 4. Acquisitive possibility modals in South(east) Asian languages

Possibility Languages		**Participant-external**	**Participant-internal**
Indo-Aryan Sino-Tibetan	Hindi, Bangla Burmese	+	–
Sino-Tibetan Mon-Khmer Hmong-Mien Tai-Kadai	Lahu, Mandarin, Cantonese, Xiang Khmer, Muong, Vietnamese Hmong Lao, Thai, Zhuang	+	+
Mon-Khmer	Pacoh	–	–
No language		–	+

If one compares Tables 2 and 4, one will see that the pattern is exactly the same: languages may use their 'get' verb for a participant-internal meaning but only if they also have it for a participant-external meaning. Lao (29) illustrates this point.

(29) Lao (Enfield 2003: 101)

phen^{1}	*vaw*^{4}	*phaa*^{2}	*saa*^{3}	*laaw*^{2}	*bò*^{0}	***daj***^{4}
s/he	speak	language	Lao	not	get	

'S/he can't speak Lao.'

The inability to speak Lao may be due to the absence of a permission (participant-external) or the lack of knowledge or learning (participant-internal). As made clear for the Northern European languages, the acquisitive markers entering the participant-internal area may have competition from other markers. In Lao, for instance, there is also a specific verb for intellectual capacity, i.e. *pên*^{3}. How the competition is settled depends on the language: in Estonian, intellectual capacity remains exclusive to the relevant verb (*oskama*), in Lao, it is not: the domain allows both the specific *pên*^{3} and the general (acquisitive) *daj*^{4} (Enfield 2003: 101–2). Vietnamese, for example, seems to be like Estonian (see Simpson 2001: 125–6).

Like for Northern Europe, the present polysemies are again compatible with the hypotheses that when an acquisitive lexeme enters the realm of possibility, it either first reaches participant-external possibility and it may afterwards continue into participant-internal possibility or it reaches participant-internal possibility first, then continues towards participant-external possibility and loses the initial sense. For South(east) Asia, we have two kinds of evidence that the first path is more likely, at least for some languages. First, Enfield (2003: 38) points that the relevant 'get' verbs of the present-day Southeast Asian languages are all non-agentive, i.e. they are more like English *receive* and *acquire* than like English *get* – see the discussion of (22). If the relevant verbs were equally non-agentive, i.e. participant-external, at the time they developed the modal senses, then the first modal senses to be reached must have been the participant-external ones. Second, the hypothesis that participant-external possibility came first is supported in the diachronic study in Li (2004) for Mandarin. Li (2004: 227–9) argues that the *dé/de* verb (得), documented since the first inscriptions (1150–771), is attested first with a participant-external reading (3rd c. BC – 1st c.) and much later (from the 11th c. on) with the participant-internal one (cf. also Sun 1996: 108–162).[12]

Note also that like the Circum-Baltic region, Southeast Asia is an area with much language contact. Given the highly similar polysemies found in the area, given that the etymons are sometimes strikingly different – a point stressed by Enfield (2003: 320–35) – though sometimes also arguably similar, either because of a common origin or borrowing – the perspective taken by Li (1991: 42–6) and Matisoff (1991: 419–25) – given also that the acquisitive modals sometimes have word order properties that set them apart from other auxiliary type constructions in the language – a point stressed by e.g. Simpson (2001) and by Sybesma (2006), it is clear that language contact must have played a significant role and that acquisitive possibility is an areal feature (see Simpson 2001: 91–2 for a diachronic hypothesis).

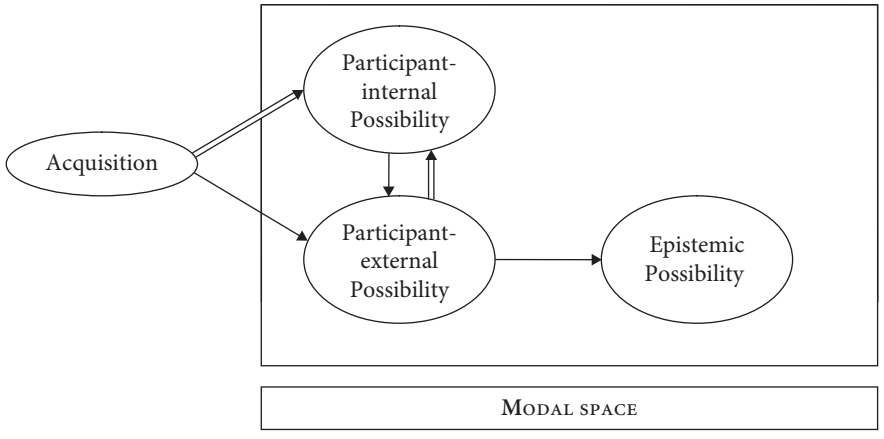
12. Wu (2005: 363) claims that in the Xiang dialects the *de* etymon meaning 'obtain' lead to volition before possibility. Her concern is with present-day Xiang. Even though it is clear that the preverbal *de* in modern Xiang can express volition – compare the discussion of Danish *gide*, it is not obvious how Wu (2005) can derive the diachronic hypothesis from the synchrony.

Interestingly, even though for language-internal semantic reasons languages in this region will not develop a participant-internal meaning without having a participant-external one, they may of course neglect this and calque or borrow a participant-internal one only. But there is no evidence that this happened. This allows for the hypothesis that what was calqued was not an isolated use, but a use that relates to its polysemy, more concretely, a use that ties up modal sense with the non-modal ones. This process is captured well with the term 'polysemy copying' (see Heine & Kuteva 2005; Gast & van der Auwera 2006).

Note finally that we have not discussed the syntax of the various markers and patterns. For instance, the ***daj***^{4} in (29) is postverbal but it turns out that South(east) Asian makers can sometimes be preverbal as well as postverbal. We will briefly discuss this in Section 7.

6. Modality's map *re*revisited

The analyses of the acquisitive modality in Northern Europe and South and Southeast Asia have made it clear that the link between participant-internal and participant-external possibility has to be reconsidered. The revision is double: (i) the meaning of acquisition may feed into participant-external possibility and from there into participant-internal possibility (we find direct evidence in Mandarin, indirect evidence in other South(east) Asian languages, and the Northern European languages are all, except for Danish, compatible with this hypothesis); (ii) the meaning of acquisition may also feed into participant-internal possibility (direct evidence in Danish, and other Northern European languages are compatible with this hypothesis). We therefore propose to replace Map 7 by Map 10. The new arrows are the double-barreled ones.



Map 10. The bidirectionality between participant-internal and participant-external possibility

Compared to the orginal map, Map 10 is, of course, more permissive. From an esthetic or 'theoretical' point of view, this may be found deplorable, but not from an empirical point of view. Note also that the map does not show how frequently various paths are travelled. Given the available evidence it indeed seems to be the case that the path from participant-internal to participant-external possibility has been useful in languages from all corners of the world, whereas the opposite, the change from participant-external to particiant-internal seems to have happened in fewer areas.

7. Other issues

The map has been revised now. Acquistive modality has been given its place. However, the introduction did not only promise a revision. It also promised at least a checklist of other important issues and tasks. Of course, the preceding sections have already pointed at some of them. They have stressed the need for detailed diachronic work, whenever possible, of course – the problem is that for many of the relevant languages historical records are simply lacking. More work, diachronic and synchronic, is also necessary to clarify the relation between the possibility meanings and the other meanings, especially the ones called 'actuality' in MM (illustrated with (19) and (20)), but more generally treated as 'aspectual'. Map 10 represents the possibility meanings as deriving from 'get' etymons, but probably the aspectual meanings have to come in between. This was in fact already proposed in MM, and Enfield (2003) spells out this hypothesis for Southeast Asian languages in great detail. He also spells out the hypothesis (already found in the diachronic literature on Chinese – see Sun 1996: 108–62) that modality meanings arise along two paths, associated furthermore with a different word order. In the order with the 'get' marker in front of the lexical verb, the latter is originally the complement of 'get': so one does not get a simple thing, but a state of affairs. In the other path the 'get' is originally the second verb in a set of two verbs, a kind of serial verb construction, in which the second verb expresses to the result of the compound process – this path was already considered in Haiman (1999: 152). It is the second path that leads to the possibility meanings described in Section 5, and, at least in Southeast Asia, according to Enfield (2003), the first path actually yields a necessity reading, more specially a participant-external one.

(30) a. lexical 'get' + lexical verb → necessity + lexical verb
b. lexical verb + lexical 'get' → lexical verb + possibility

The path of the necessity is illustrated with Lao (31).[13]

(31) Lao (Enfield 2003: 147)

phen[1] *huu*[3] *nuak*[5] - ***daj***[0] *vaw*[4] *dang*[3]
(s)he ear deaf must speak loud
'(S)he is deaf – one has to speak loud.'

The hypothesis about there being two paths is argued very convincingly, but we are less convinced about the correlation between the word orders and the two interpretations, or at least about the strength of the relation. First, in Mandarin, the relation holds only synchronically, not diachronically, for the ancestor of the current marginal possibility meaning, which is postverbal as expected, was preverbal – and still is in legal documents (Sun 1996: 131–2) as well as in at least one dialect area, the Xiang dialects of Hunan (Wu 2005: 343–63). Obviously, the scenario in (30b) does not explain this: the scenario is supposed to give only a postverbal possibility marker, not a preverbal one. Second, Vietnamese, Thai and Nung are problematic too. According to Enfield (2003) Vietnamese behaves according to the schema in (30), but then Nguyen (2006: 44) criticizes this, for Vietnamese also uses the relevant modal for preverbal possibility (cf. also Sybesma 2006). Thai is not really discussed at any length by Enfield (2003) and Nung is absent, but for Thai Srioutai (2006: 150–4) argues that *dây* can express possibility both in preverbal and postverbal position, and the same is claimed for Nung *daj* (Saul & Wilson 1980: 48, 55–6). Third, when leaving Southeast Asia towards the West, one reaches Burmese, which has a marker with an absolutely fixed position, a postverbal one, which allows both participant-external possibility and necessity readings. This is illustrated in (32).

(32) Burmese (Vittrant 2004: 313)

a. *di ɲa'-ne nin yoʔʃinyon 'θwa lo' **ya'** tɛ*
this night-day 2SG movies go like get REA.ASS
'You can go the movies tonight.'

b. *'min ko tɘ-son-tɘ-ya me'myan khɛ' yin*
2SG OBJ one-CLF-one-thing ask PST if
*'θwɛʔ-θwɛʔ- lɛʔ- lɛʔ- phye **ya'** mɛ*
quickly answer get IRR.ASS
'If he asks you something, you must answer him quickly.'

13. Enfield (2003) argues that in at least Lao this reading is only pragmatic, as a more or less common enrichment of a semantic aspect meaning.

Fourth, the same disregard for word order is found in Northern Europe. At least in Swedish, in Finno-Lappic and in both of the Baltic languages the markers also allow participant-external necessity readings – see Estonian (33).

(33) Estonian (Uuspõld 1989: 474)

Sa-i-n *oodata, et mine võ hullu-ks.*
get-PST-1SG wait.INF that go.IMP.2SG or crazy-TRANSL
'I had to wait so long that I was getting crazy.'

At least four scenario's, all starting from a lexical 'get' present themselves as relevant for explaining the possibility-necessity polyfunctionality, and each may be correct, but for different languages or even different historical stages of a language:

i. each meaning results from a different path (e.g. Sun 1996; Haiman 1999; Enfield 2003);
ii. the possibility meaning came first and necessity developed out of it; this is what happened with English *must* and may happen again with *may*;
iii. the necessity meaning is the primary one, with possibility as the extension, as has happened with German *dürfen*;
iv. each meaning is just an instantiation of a vague participant-external modality; this is what we find with the German construction with *sein* 'be', illustrated in (9) (a scenario given to acquisitive modality in MM 104).

Note that for scenario's (ii) and (iii) negative contexts can be important, the equivalence of 'not necessary' and 'possible not' allowing necessity to be reanalysed as possibility and vice versa. Exactly this analysis has indeed been argued to be relevant for the Germanic changes, the change from possibility to necessity for *must* and the one from necessity to possibility for *dürfen* (Gamon 1993: 156–61; van der Auwera 2001b). One factor which may facilitate the reanalysis – and it was relevant for *dürfen* but not for *must* – is the negative polarization of the modal, in which case the positive modal meaning may become opaque and unstable. It is suggestive that various South(east) Asian languages indeed have negatively polar acquisitive modals: Hindi and Bangla (van der Auwera 2001a), earlier Mandarin (Sun 1996: 122; Ziegeler 2002: 246–7) and Zhuang (Sybesma 2006).

Note that English also allows necessity *get* readings. One type is clearly still pragmatic. The sentences in (34) are the *get* counterparts to the *may/mogen* sentences in (15) and (16): in (34a) the general is speaking again and in (34b) we have the unwilling cook.

(34) a. You **get** to leave now.
b. Your mom isn't home. So I **get** to cook tonight.

The other type is rather different from anything else we have illustrated so far.

(35) a. I **have got** to go now.
b. I **gotta** go now.

The meaning of *get* in (35) owes its existence not so much to acquisition as to completed acquisition, i.e. possession, just like *have* in (11), a point already made in MM (119) and now fully corroborated by Gronemeyer (1999, 2001) and especially Krug (2000). The formal identity of the *got* in the *have*-less form *gotta* and the past tense possibility marker *got* must now amount to homonymy (see van der Auwera & Temürcü 2006: 133 for a brief discussion of the problem of homonymy in semantic maps and another illustration in the realm of modality).

Another issue we want to bring up is the following. We have argued that the relation between participant-internal and participant-external possibility is not unidirectional. But how about the relation between participant-internal and participant-external necessity? MM had this as unidirectional as well, from the internal to the external, but this is worthy of reconsideration, too. And in fact, it has been reconsidered, and what prompted it was not just any necessity marker, but one of the acquisitive type. Thus it is for the necessity meanings of acquisitive *děi* that Li (2004: 23) argued that it started in the participant-external range and reached the participant-internal domain later (cf. also Ziegeler 2002: 249). Li (2004: 92–3) also hinted at the plausibility of this hypothesis for English *need*, and in a detailed corpus-based diachronic study Taeymans (2006) finds this to be correct (in accord also with Loureiro Porto 2005: 122). Essentially, modern *need* goes back to an impersonal 'it is compelled' construction, which expresses an external compulsion (further back still is a personal construction in which the *need* verb meant 'compel'). Of course, the necessity of *need* has nothing acquisitive about, different from the case of Mandarin *děi*, but both show that a modal development can go from the participant-external to the participant-internal.

A final issue concerns the epistemic meanings of acquisitive possibility. The semantic map predicts that participant-external acquisitive modals may but need not develop epistemic meanings. Not unexpectedly, they are much rarer than the ubiquitous participant-external ones, both in South(east) Asia and in Northern Europe. For the Finnic languages, for instance, as surveyed in Kehayov and Torn (2006) only Estonian is credited to have it. (36) is an example.

(36) Estonian (p.k., variation on Erelt 2003: 107)
Ootamatusi ***saa-b*** *juhtuda.*
surprises get-PRS.3SG happen.INF
'There may be surprises.'

Curiously, according to Habicht (2001), this epistemic meaning is attested before the participant-external one. If the attestations reflect the true diachrony, then this is not the way it should be, at least not, semantically. Fortunately, Habicht (2001) offers at least a partial solution: the epistemic meaning is argued to be a calque from German *werden*. This then would be an example of a calque that does not respect the semantic map.

8. Conclusion

We have argued that there is enough evidence, indirect and direct, for the hypothesis that acquisitive modality forces us to rethink the directionality of the link between participant-internal and participant-external modality, more particularly possibility. We have analyzed some of the markers that are found in what seem to be two hotbeds of acquisitive modality, Northern Europe and South(east) Asia. Curiously, for both areas acquisitive modality constitutes an areal feature. We have pointed to the need for detailed historical research and we have briefly pointed at other issues, like the link between possibility and necessity meanings and the role of negation. With this article we hope to have contributed to the cross-linguistic visibility of acquisitive modality. Perhaps we will find it in other language families and areas too. Viberg (2002: 147) is a little pessimistic in this respect, and the perusal of 234 languages undertaken by van der Auwera and Ammann (2005) did not yield any positive results either. But we know of at least one more language, viz. Classical Greek with χανδάνω (*OED*, lemma *get*; Liddell & Scott 1961: lemma χανδάνω.).[14] Finally, this exercise also has an implicit methodological goal. Semantic maps may be wrong or incomplete, but they can be falsified and refined. Koptjevskaja-Tamm (2008) compares the work of Viberg (2002, 2006) and Enfield (2003) and laments on the lack of an appropropriate cross-linguistically valid semantic meta-language. After the present *re*revisit of at least some modal aspects of the polysemies of 'get' etymons in Northern Europe and South(east) Asia, the sustained usefulness of the semantic map tool keeps us optimistic.

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14. Heine and Kuteva (2002: 144) list a language from another part of the world, too, viz. Réunion Creole French (with reference to Corne 1977: 144), but there the source meaning is 'win, gain' (French *gagner*). This is maybe a somewhat different matter though. In Southeast Asia we also find 'win, gain' etymons as a source of modality (Vittrant 2004 for Burmese and Enfield 2003 for Lao), but at least some of these are different from the 'get' etymons and when they are different they seems to yield participant-internal possibility, as does the Réunion Creole case.

Abbreviations

ACC	accusative	OBJ	object
ASS	assertive	PL	plural
CLF	classifier	PRS	present tense
CON	connective	PRT	partitive
FIN	clause-final marker	PST	past tense
IMP	imperative	REA	realis
INF	infinitive	SG	singular
IRR	irrealis	TOP	topic
NEC	necessity marker	TRANSL	translative
NEGV	negation verb		

In the examples 'p.k.' stands for 'personal knowledge' and 'p.c.' for 'personal communication'.

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Conflicting constraints on the interpretation of modal auxiliaries*

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The Dutch modal auxiliaries *kunnen* 'can' and *moeten* 'must' can be interpreted in different ways: 'participant-internal', 'participant-external', and epistemic. For each of the verbs, we assume a basic, default interpretation: 'participant-internal' for *kunnen*, 'participant-external' for *moeten*. In sentences with a 'neutral' main verb like *zwemmen* 'to swim', and with a third person subject, the hearer chooses this basic interpretation. We subsequently show that other elements in the sentence can induce a non-basic interpretation. In particular the controllability of the activity expressed in the main verb ('to swim' versus 'to pee'), progressive aspect, and person of the subject (in particular second person subject) are relevant factors influencing the interpretation of the modal verb. We model the factors influencing the interpretation as violable constraints in an optimal theoretic analysis, which leads to tableaux with a sentence as input and an optimal interpretation of that sentence as output.

1. Introduction

Consider the sentence in (1), which can be used by a speaker to describe the state of affairs such that (at least according to the speaker) there is a possibility that he (whoever *he* refers to) will try to put the key into this slot. However, if we replace the third person pronoun *he* by the second person pronoun *you*, a different interpretation emerges as the preferred one.

(1) He might try to put the key into this slot.

(2) You might try to put the key into this slot.

The second sentence is preferably read as a suggestion by the speaker to the addressee to put the key into the slot (von Fintel 2006). Hence, the sentence is no

*We are grateful to Richard van Gerrevink, Lotte Hogeweg, Kees de Schepper, Joost Zwarts, and the other colleagues of the Optimal Communication research group in Nijmegen for many inspiring discussions. This paper also benefited from the comments and insights of two anonymous reviewers. Helen de Hoop gratefully acknowledges the Netherlands Organisation for Scientific Research (NWO) for financial support.

longer meant to convey information about the world (it might happen that…), but rather to instruct the addressee. Notoriously, the auxiliary *might* in English usually triggers an epistemic modal reading as in (1), but strikingly, the same sentence with *you* gets a reading that can be characterized as a 'directive' modal reading in the terminology of Nuyts et al. (2007). We claim that it is not a coincidence that the sentence with the second person pronoun favours this reading. In general, it does not make sense for a speaker to convey information about the addressee to the addressee. Thus, the interpretation of the sentence with *you* readily shifts to a more interactive interpretation.

An important aspect of linguistic interpretation is the disambiguation of polysemous items. The linguistic and extra-linguistic context provides the 'material' that the 'disambiguator' has to work with. In order to bring the interpretation process to a (good) end, there must be some order in it, for example by ranking the weight of the different (potentially conflicting) contextual factors.

In this paper, we investigate the interplay of several of these factors when we interpret sentences with the modal verbs *moeten* 'must' and *kunnen* 'can' in Dutch. Modal readings are known for their context-dependency (Kratzer 1981, 1991). We will examine how these different readings are obtained as the result of the combined or conflicting influence of different factors that determine the interpretation of the Dutch modal auxiliaries *moeten* 'must' and *kunnen* 'can' in context. We focus on simple, constructed sentences and propose an analysis within the framework of Optimality Theoretic semantics (Hendriks & de Hoop 2001). We hope to show that Optimality Theoretic semantics is able to account for the interaction of the different constraints that come into play. We will briefly investigate the influence of the basic meaning of the modal auxiliary, the lexical and aspectual properties of the main predicate, and the grammatical category 'person', i.e., whether the subject is first, second or third person. Presumably, other factors, like tense or sentence type, play a role as well, not to mention the various aspects of the extra-linguistic context. Van Gerrevink (2008) proposes a bidirectional optimization analysis of the interaction between modality, tense, and aspect in the interpretation of the Dutch modal verb *moeten* 'must', for example. In this paper, we cannot deal with all these different factors that play a part, but we hope that our present analysis can serve as a starting point to take these other factors into consideration, so that, in the long run a model can be developed that 'simulates' the complete interpretation processes that give rise to the wide variety of modal readings in context.

2. The basic readings of *kunnen* 'can' and *moeten* 'must'

First of all, we would like to determine which interpretation is the basic (default) interpretation of the modal auxiliaries *kunnen* 'can' and *moeten* 'must'. We believe

that the basic reading of the Dutch modal verb *kunnen* 'can' is the ability reading 'be able to', whereas the basic reading of the auxiliary *moeten* 'must' is the deontic reading 'be obliged to'. That means that out of the blue, without any further context, these readings are the first that spring to mind when hearing these verbs.

In dictionaries, the ability reading is usually the first one given for the verb *kunnen* 'can'. In Van Dale (1984), for example, *kunnen* 'can' gets as its primary meaning: *de geschiktheid, het door aanleg of oefening verkregen vermogen bezitten het genoemde of uit het verband blijkende te doen* 'the capability, the ability obtained by talent or training to do what is mentioned or understood from the context'. Examples of this type of reading that are given in the dictionary are *hij kan goed zingen* 'he can sing well' and *hij kan nog niet lezen* 'he cannot read yet'.

The primary meaning of *moeten* was 'permission' in (Early) Middle Dutch but changed into 'obligation' in Modern Dutch (both involving deontic readings), the latter perhaps due to the simultaneous change in the meaning of *mogen* which was 'ability' in (Early) Modern Dutch, but is 'permission' in Modern Dutch (Coupé 2007). The deontic reading of obligation can also be discerned in the nominal diminutive *moetje* derived from the verb *moeten* 'must'. An unplanned pregnancy before marriage can (or used to) put a lot of pressure on a couple to marry. This marriage is then referred to as a *moetje* 'must'.

The emergence of a default interpretation can be attributed to a constraint that penalizes deviation (a shift) from the basic interpretation of a lexical item (cf. for example, van der Does & de Hoop 1998).

(3) *MEANING SHIFT:

a. *kunnen* 'can' gets an ability interpretation
b. *moeten* 'must' gets a deontic interpretation

Obviously, as soon as the modal verb is used in the context of a sentence, the constraint in (3) can get violated and other readings than the basic ones may become optimal, driven by other factors that influence the interpretation of the modal verb in context. In the next section, we will look at some instances of the modal auxiliaries in sentential contexts, and see which readings come out as most natural. The general question is what factors will force a hearer to deviate from the basic meanings for the modal auxiliaries.

3. The influence of the main predicate on the optimality of modal readings

First, consider the following example, where the main predicate is an agentive activity verb, and the subject is third person. We claim that in this example the preferred reading of the modal verb is maintained.

(4) *Hij kan zwemmen.*
he can swim
"He can swim."

As (almost) always, a sentence with a modal auxiliary is ambiguous. We discern three well-known modal readings for this sentence, which we will call 'participant-internal', 'participant-external' and 'epistemic' (following van der Auwera & Plungian 1998).

In our view, the preferred reading for (4) is still the ability reading, i.e., the sentence expresses that the subject has the ability to swim. When sentence (4) plainly describes the ability of the third person to swim, we call it a 'participant-internal' reading of the modal sentence. The second interpretation of (4) that emerges is that the given situation is such that swimming is possible for the subject, because there is a swimming pool, for example, or because the speaker allows the subject to swim, or because it is the subject's turn to swim. We use the term 'participant-external' reading here as a comprehensive term. That is, it captures both the deontic and the situational reading that we get in (4), as well as the directive (deontic) reading that we obtained for the sentence in (2) above. We use the label 'participant-external' therefore as a label for the readings that are not epistemic and not participant-internal (see also de Schepper and Zwarts, this volume). Thirdly, the sentence in (4) can get an epistemic reading: there is a possibility that he swims in (4), the world is such that it can be the case that he swims.

Whereas we claimed the participant-internal (ability) reading to be the basic reading for *kunnen* 'can' in the previous section, for *moeten* 'must' we claimed the participant-external (deontic) reading to be the basic one. Compare sentence (4) with sentence (5).

(5) *Hij moet zwemmen.*
he must swim
"He must swim."

Again, the basic reading is the reading that comes out as optimal in this type of sentence. In (5), presented out of the blue, the preferred reading is that there is some external force that requires the subject to swim, for instance the subject must swim for medical reasons, his doctor told him to. While the basic reading of *moeten* 'must' is the preferred one in (5), the other two modal readings are again possible as well. Sentence (5) gets a participant-internal reading when the subject has some internal need that forces him to swim, that is, he craves swimming. Also, an epistemic reading can be obtained: it must be the case that the subject swims, that is, it cannot be the case that he does not swim. Yet, although different modal readings are possible in (4) and (5), we assume that in the absence of further clues from the context (and without adding such clues in our mental model of the situation),

the basic interpretations of the two modal verbs will arise in the linguistic context of an agentive activity verb with a third person subject.

In the previous section, we introduced the constraint *MEANING SHIFT to account for the fact that without further context, the optimal interpretation of the modal auxiliary *kunnen* 'can' is the participant-internal (ability) reading, whereas the optimal interpretation of the modal auxiliary *moeten* 'must' in a neutral context is the participant-external (deontic) reading. Apparently, these readings are maintained in the context of an activity verb with a third person subject. We cannot detect any conflicting constraints yet that would trigger a meaning shift. Hence, the optimal readings satisfy the constraint *MEANING SHIFT, while the other modal readings violate it. We can illustrate that in two OT tableaux, in which the input is the sentence, and the output is the optimal interpretation of the given input. We will distinguish three types of modal readings (basically following van der Auwera & Plungian 1998; de Schepper & Zwarts 2007) that compete in becoming the optimal interpretation for a given modal input. Consider the derivation of the optimal output interpretation for the sentence *Hij kan zwemmen* 'He can swim' given in (4) above:

Tableau 1. Derivation of the participant-internal (ability) reading of *kunnen* 'can'

Hij kan zwemmen **he can swim**	*MEANING SHIFT
☞ Participant-internal	
Participant-external	*
Epistemic	*

Since there are no conflicting constraints that distinguish among the candidate interpretations, it is the constraint *MEANING SHIFT alone which filters out certain candidates for the given input. Not surprisingly then, the basic interpretation (which is the only candidate interpretation that does not violate the constraint) comes out as the winner of the competition. The same holds for the input *Hij moet zwemmen* 'He must swim' (sentence (5) above). Again, the basic interpretation of the modal auxiliary, in this case the deontic (participant-external) reading emerges as the optimal one in the absence of conflicting information:

Tableau 2. Derivation of the basic reading of *moeten* 'can'

Hij moet zwemmen **he must swim**	*MEANING SHIFT
Participant-internal	*
☞ Participant-external	
Epistemic	*

Clearly, the real question we would like to address in this section is which types of predicates trigger a violation of the constraint *MEANING SHIFT. For example, when does *moeten* 'must' get a participant-internal reading? One factor that influences the emergence of a participant-internal reading is the situational dependency. Consider the following sentence:

(6) *Hij moet plassen.*
he must pee
"He must pee."

The difference between the predicate in (6), *plassen* 'pee', and the one in (5), *zwemmen* 'swim', is that *plassen* 'pee' typically involves an event triggered by an internal need and not by external circumstances. Predicates can be ordered on a scale of situational dependency, running from internal to external. An activity predicate such as 'swim' is intermediate on this scale: one needs the capability but also a swimming pool in order to be able to swim. Verbs referring to a 'bodily activity' such as 'pee' or 'cough' are on the internal side of the scale. This has the effect that (6) gets a participant-internal rather than a participant-external reading: the source of the necessity expressed by *moeten* 'must' is located inside the subject. In such a case we assume that the basic (deontic) meaning of *moeten* 'must' shifts to the participant-internal reading. This shift is triggered by the meaning of the main verb. Hence, the basic meaning of the predicate (as referring to an event triggered by a participant-internal need) conflicts with the basic meaning of the modal auxiliary (which assumes the presence of an external force), and apparently the former is stronger than the latter, which results in participant-internal modality. Before we can illustrate this in a tableau, we need to introduce the constraint BODILY ACTIVITY that states that the source of the activity is participant-internal:

(7) BODILY ACTIVITY:
Bodily activity verbs such as *plassen* 'pee' refer to an activity resulting from an internal (physical) source (= participant-internal).

Now we can illustrate how the constraint *MEANING SHIFT can be violated and how the participant-internal reading becomes the optimal one for the modal verb *moeten* 'must' in the context of such a bodily activity verb:

Tableau 3. Derivation of the participant-internal reading of *Hij moet plassen* 'He must pee'

Hij moet plassen **he must pee**	BODILY ACTIVITY	*MEANING SHIFT
☞ Participant-internal		*
Participant-external	*	
Epistemic	*	*

Thus, for sentence (6) *Hij moet plassen* 'He has to pee', we obtain a participant-internal reading, due to the lexical meaning of the predicate *plassen* 'to pee', which typically refers to participant-internal necessity.

When do we expect to get an epistemic reading for a modal verb *moeten* 'must' or *kunnen* 'can' in Dutch? An epistemic reading involves an estimation of the likelihood that a certain state of affairs is the case. In the examples so far the main predicates were activity verbs. With stative predicates, the epistemic reading may be more salient. Stative readings refer to a state, such as 'be at home' or 'be ill'. Sentence (8) gets as its preferred reading the epistemic modal reading: it can be the case (it's possible) that he is sick (cf. Boogaart 2007; van Gerrevink 2008).

(8) *Hij kan ziek zijn.*
he can ill be
"He can be ill."

The preferred reading of (8) is an epistemic reading, although we can think of contexts in which (8) gets a participant-external (e.g., deontic) reading (when someone allows the subject to be ill) or even a participant-internal reading (the subject, e.g., a robot, is capable of being ill, he has this ability). The reason that (8) readily gets an epistemic reading is not just because the complement predicate is stative. The epistemic reading is also triggered by the fact that a predicate such as 'be ill' refers to a state of affairs the subject nor anybody else can control. We assume that when the modal auxiliary is combined with such a predicate, it is biased for an epistemic reading, since the other two readings (participant-internal and participant-external) require some controllability of the situation. This can be put in a constraint, which again must be stronger than the constraint *MEANING SHIFT as it gives rise to an epistemic reading of a modal auxiliary when the complement predicate refers to a non-controllable state of affairs. A simplified version of such a constraint can be formulated as in (9):

(9) CONTROLLABILITY:
Participant-internal and participant-external interpretations require some degree of controllability of the situation.

In an OT semantic tableau this would give the following result:

Tableau 4. Derivation of the epistemic reading of *Hij kan ziek zijn* 'He can be ill'

Hij kan ziek zijn **he can be ill**	CONTROLLABILITY	*MEANING SHIFT
Participant-internal	*	
Participant-external	*	*
☞ Epistemic		*

To sum up our account so far, we have seen that modal auxiliaries can come with their own preferred interpretation, but that the combination of the modal verb with a lexical predicate can overrule this preference. We discussed two 'classes' of lexical predicates that induce such a shift: bodily activity verbs tend to give rise to a participant-internal reading of the modal verb, while predicates referring to non-controllable states of affairs prefer an epistemic reading of the modal verb.

Apart from the lexical characteristics of the main predicate, the grammatical properties of tense and aspect also influence the type of modal reading that arises (see in particular, Hacquard 2006; van Gerrevink 2008). In the next section we will discuss one such interaction, that is, the influence of progressive aspect on the type of modal reading.

4. Progressive aspect and the emergence of the epistemic reading

Not only the modal auxiliary and the properties of the main predicate can influence the type of reading that occurs, also tense and aspect matter. Consider for example the case of progressive aspect. We have seen that the sentences in (4) and (5), repeated below, get a participant-internal (ability) and a participant-external (deontic, situational) reading, respectively:

(10) *Hij kan zwemmen.*
he can swim
"He can swim."

(11) *Hij moet zwemmen.*
he must swim
"He must swim."

However, if we change the aspect of these sentences to progressive aspect, then independently of the modal verb that is used, we get the epistemic reading as the optimal one:

(12) *Hij kan aan het zwemmen zijn.*
he can at the swimming be
"He can be swimming."

(13) *Hij moet aan het zwemmen zijn.*
he must at the swimming be
"He must be swimming."

Thus, we see that progressive aspect triggers the emergence of the epistemic reading for both *kunnen* 'can' and *moeten* 'must' (Coates 1983: 137). The question is why.

Note that progressive aspect is used to anchor the realization of the event in the actual world. When somebody is swimming, then he actually swims. When somebody *was* swimming, then he actually swam. This property of the progressive can be called 'actuality entailment' (Hacquard 2006) and it can be argued to conflict with the basic characteristic of modality which is that there is no such actuality entailment (Narrog 2005; van Gerrevink 2008). Modality is defined by Narrog (2005) 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 (…)" (Narrog 2005: 184). This view corresponds to the insight from formal approaches to modality in which modals invoke possible (accessible) worlds that enable us to talk about non-actual situations (cf. Kratzer 1981, 1991; Hacquard 2006). This is also discussed in Kaufmann et al. (2006) who provide the following pair of sentences:

(14) It rained overnight.

(15) It must have rained overnight.

As pointed out by Kaufmann et al. (2006), if the modal in (15) universally quantifies over a set of worlds including the actual world, one might predict (15) to entail (14), but this prediction is not borne out. In other words, while the non-modal sentence in (14) has actuality entailment, its modal counterpart in (15) has not. A sentence with a modal verb is said to have actuality entailment if its complement is forced to hold in the actual world. This means that the implication that the complement holds in the actual world cannot be cancelled. The faithfulness constraint of a modal expression prohibiting an actuality entailment can be formulated as follows (van Gerrevink 2008):

(16) FAITHMODAL: A modal verb leads to undetermined factuality status.

However, Hacquard (2006) notes that modal verbs in the perfective in French do have actuality entailment, and van Gerrevink (2008) discerns the same pattern in Dutch. Hacquard (2006) concludes that the actuality entailment that arises in these perfective modal constructions are the result of the interplay between modality and aspect. Van Gerrevink (2008) analyses this interplay in terms of two conflicting faithfulness constraints. The constraint in (16) conflicts with a faithfulness constraint on perfective aspect, which does require actuality entailment. As pointed out by van Gerrevink (2008), in the case of a modal verb with perfective aspect, the conflict is resolved in favor of faithfulness to perfective aspect, hence there is actuality entailment (see van Gerrevink 2008 for a bidirectional optimization account of this interaction between modality and aspect).

In contrast to modal verbs, the progressive has a strong actuality entailment. This leads to a tension when combined with a modal verb: the progressive requires

the event to actually hold whereas the modal verb requires the actuality of the event to be undetermined. In our view, an epistemic interpretation resolves this tension. Epistemic modality involves the speaker's estimation of the likelihood that a certain state of affairs is the case, hence the actuality entailment of the progressive is cancelled by the epistemic reading itself, and FAITHMODAL is satisfied. A situation in which the proposition turns out to be false in the actual world, is possible under an epistemic reading, whereas this is infelicitous for a progressive without the modal, as illustrated below:

(17) *Hij is aan het zwemmen. [#Maar hij is niet aan het zwemmen.]*
he is at the swimming
"He is swimming." [#But actually, he is not swimming.]

(18) *Hij kan aan het zwemmen zijn. [Maar hij is niet aan het zwemmen.]*
he can at the swimming be
"He can be swimming." [But actually, he is not swimming.]

(19) *Hij moet aan het zwemmen zijn. [Maar hij is niet aan het zwemmen.]*
he must at the swimming be
"He must be swimming." [But actually, he is not swimming.]

Note that the sentences between brackets are not meant as continuations in the sense that a speaker first states that he is swimming, but in the same breath that he is not (cf. Geurts & Huitink 2006). Rather, the parts between brackets refer to situations which serve to verify whether a sentence has actuality entailment or not. As we argued above, modal auxiliaries such as *kunnen* 'can' and *moeten* 'must' always express a degree of uncertainty with respect to the factuality of its complement. So, (18) and (19) can both be used in a situation in which the subject is actually not swimming, but (17) cannot. We would like to claim that the progressive aspect itself has an actuality entailment, i.e., it entails the realization of the event in the real world/time. Yet, one way in which the modal can still satisfy FAITHMODAL is by an epistemic reading, such that it is indeed the truth of the proposition (in the actual world) that the speaker is uncertain about. This is illustrated in two tableaux for the examples in (18) and (19) above.

Tableau 5. Derivation of the epistemic modal reading of *kunnen* 'can' + progressive

Hij kan aan het zwemmen zijn **he can be swimming**	FAITHMODAL	*MEANING SHIFT
Participant-internal	*	
Participant-external	*	*
☞ Epistemic		*

Tableau 6. Derivation of the epistemic modal reading of *moeten* 'must' + progressive

Hij moet aan het zwemmen zijn **he must be swimming**	FAITHMODAL	*MEANING SHIFT
Participant-internal	*	*
Participant-external	*	
☞ Epistemic		*

To sum up, even though the epistemic reading violates the constraint that penalizes a deviation of the basic reading for a modal auxiliary, sometimes these basic readings are ruled out for other reasons, and then the epistemic reading can emerge. In particular, when the complement of a modal auxiliary is in the progressive, then the progressive aspect itself, which involves the actual realization of an event in the real world, favors an epistemic reading because only then the speaker's uncertainty with respect to the factual status (the actuality entailment) of the proposition is guaranteed.

Note, by the way, that if the actuality entailment of the progressive is cancelled by other factors, for example because the event is situated in the future, then there is no clash in actuality entailment between modality and the progressive, and the interpretation of the modal verb will 'return' to a non-epistemic interpretation:

(20) *Schiet op, want je moet om 10 uur aan het studeren zijn.*
hurry up because you must at 10o'clock at the studying be
"Hurry up, because you should be studying at 10 o'clock."

In (20), despite the progressive aspect, the natural interpretation is participant-external, and an epistemic reading is not even possible. Other examples, where progressive complements can occur with deontic modals are taken from Papafragou (2000: 102):

(21) One must be watching the children every minute, otherwise who knows what they'll come up with.

(22) We must be leaving soon.

Example (22) is comparable to (20) above, as the event referred to in the complement is situated in the future. In (21) we get a generic reading, which also seem to cancel the actuality entailment of the progressive. That is, sentence (21) can be used in a situation when one does not actually watch the children every minute.

5. Second person and the directive (participant-external) reading

In this section we wish to examine the influence of subject person on the type of modal reading that we get. Note that so far in our analysis we only used sentences

with third person pronouns, which we assume is a neutral person that is most likely used in neutral descriptions of the world, even though we have argued that modality always involves a certain degree of uncertainty.

However, as already mentioned in the discussion of sentences (1) and (2) above, we believe that the use of a second person pronoun has a different effect. We claim that second person pronouns favour a participant-external reading, more in particular a 'directive' reading (Nuyts et al. 2007).

Below we will consider the replacement of a third person pronoun by a second person pronoun in contexts that normally give rise to other than participant-external readings. This was already discussed with respect to sentence (2) above. Sentence (2) shifts from an epistemic reading (triggered by the English auxiliary *might*, which is specialized for an epistemic reading) to a directive reading. Thus, as before we witness the violation of *MEANING SHIFT in order to satisfy a higher constraint, this time a constraint that requires sentences with a second person pronoun to get a directive reading, which can be formulated as follows:

(23) 2-DIRECTION:
The second person pronoun triggers a directive interpretation.

We illustrate the derivation of the participant-external reading of (2) in a tableau.

Tableau 7. Derivation of the directive reading of *You might try to put the key into this slot*

You might try to put the key into this slot	**2-DIRECTION**	***MEANING SHIFT**
Participant-internal	*	*
☞ Participant-external		*
Epistemic	*	

Now, consider the use of a second person pronoun in a sentence that would get a participant-internal interpretation otherwise.

(24) *Hij moet hoesten.*
he must cough
"He must cough."

(25) *Je moet hoesten.*
you must cough
"You should cough."

Again, we see that the use of a second person pronoun triggers a participant-external interpretation: an utterance as in (25) is typically interpreted as a directive, the addressee is encouraged to cough. In a tableau this looks as follows:

Tableau 8. Derivation of the participant-external reading of *Je moet hoesten* 'You should cough'

Je moet hoesten **you should cough**	2-DIRECTION	BODILY ACTIVITY	*MEANING SHIFT
Participant-internal	*		*
☞ Participant-external		*	
Epistemic	*	*	*

As a final illustration of the influence of the second person pronoun, consider the following pair of sentences:

(26) *Hij móét op deze baan solliciteren.*
he must on this job apply
"He *must* apply for this job."

(27) *Jij móét op deze baan solliciteren.*
you must on this job apply
"You *must* apply for this job."

Although both sentences readily get a participant-external reading due to the use of the modal auxiliary *moeten* 'must', the type of participant-external reading differs. Clearly, with the (stressed) modal auxiliary *moeten* 'must' the speaker tries to emphasize her view that it is very important that the addressee will apply for the job. Thus, (27) is read as a strong suggestion towards the addressee. If there is no stress on *moeten* 'must', the message gets less urgent, but can still be read as a suggestion of the speaker to the hearer that the latter should apply. This can be called a directive reading. If the third person pronoun is used, however, we also get a participant-external reading, but one that simply describes the state of affairs that there is some kind of external force that makes that he will apply. This can be the fact that he has an obligation to apply for every appropriate job, otherwise he will loose his unemployment benefit.

6. Conclusion

Dependent on the type of lexical predicate, aspectual properties, and the person of the subject, different modal interpretations are obtained for the modal auxiliaries *kunnen* 'can' and *moeten* 'must' in Dutch. In the domain of modality, interpretive preferences are indeed just preferences which may be overridden, suggesting that they can be analysed in terms of violable and potentially conflicting constraints. That is, the complement predicate of a modal obviously influences the interpretation of that modal, but it is not the case that a bodily activity verb such as

hoesten 'cough' necessarily guarantees a participant-internal reading of the modal. For example, the use of progressive aspect, as in *Hij moet aan het hoesten zijn* 'He must be coughing', induces a shift to an epistemic reading, whereas the use of a second person pronoun, as in *Je moet hoesten* 'You should cough', induces a shift to a participant-external reading. In order to deal with this interaction of constraints of different nature, we came up with a semantic Optimality Theoretic account. Such an account cannot only capture the fact that interpretive tendencies can be neutralized in certain contexts, but also that not all tendencies are equally strong. Thus, when there is a conflict between two tendencies (constraints), their mutual ranking can be used to predict what will be the optimal outcome.

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Modality and context dependence*

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This paper argues that the analysis of modality in terms of generalized quantification falls short on three issues. First it is shown that such an analysis encounters serious problems when it come to deontic modality. Second I will show that the standard analysis makes false predictions by allowing unwanted combinations of modal items. Third I will argue that the data from Lillooet challenges the position that modality should be analyzed across the board as the interaction of a neutral operator with an externally provided intensional context. Finally I will sketch a solution to those problems within the framework of update semantics. I will propose a polysemous treatment of modality where each modality type (epistemic, deontic and circumstantial) has a distinct meaning.

1. Introduction

Nowadays the standard analysis of modality is in terms of generalized quantification. Modals are construed as neutral propositional operators with a specific force, contextually dependent on an intensional context that fixes their interpretation as epistemic, deontic or circumstantial:

Operator [intensional context] [nuclear scope]

I will present three problems for this type of analysis and explain the constraints those problems put on any theory of modality that wants to avoid them. This paper will be divided as follows. I will present in Section 2 a version of Kratzer's semantics of modality (Kratzer 1991) and then turn in Section 3 to three problems this analysis has to face. The first problem is about the analysis of deontic modals (Zvolenszky 2002). The focus will be on determining the part of the contextual evidence that is relevant for the evaluation of a deontic statement. The second problem has to do with the context dependence of types of modality, that is, with the assumption that the intensional context fixes the interpretation of a modal item as epistemic, deontic or circumstantial. I will argue that both problems are

*I would like to thank Johan van der Auwera, Kai von Fintel, Kees Hengeveld, Rosja Mastop, Frank Veltman, two anonymous reviewers and all the participants of the TAM TAM Workshop for helpful discussion.

directly linked to the nature and effect of the intensional context in the semantics of the standard analysis. The last problem will concern the combinations of types of modality. I will show that the generalized quantifier analysis has serious shortcomings when it comes to explaining some patterns of combinations. Finally in Section 4, I will give a rough sketch of some solutions to these problems.

2. Formal semantics of modality

The standard analysis is heavily based on the English modal verbs (originally on their German counterparts (Kratzer 1978, 1981)). One of the main characteristic of those modal verbs is that they are apparently polysemous as exemplified in the following example with the semi-modal *have to* (von Fintel 2006: 2):

(1) a. It has to be raining. [after observing people coming inside with wet umbrellas; epistemic]
b. Visitors have to leave by six pm. [hospital regulations; deontic]
c. You have to go to bed in ten minutes. [stern father; bouletic]
d. I have to sneeze. [given the current state of one's nose; circumstantial]
e. To get home in time, you have to take a taxi. [telelological]

The main thread from Kratzer (1978, 1981) to Kratzer (1991) is that Example (1) is not a case of ambiguity or polysemy of modal verbs but a consequence of their context dependent nature. Namely, all the examples in (1) have in common the following three ingredients:

1. An (neutral) **operator**, i.e. the modal verb: *have to*.
2. An **intensional context**: in example (1a) this context would probably have two parts, a factual part, "people come inside with wet umbrellas," and a normative world knowledge part "when umbrellas are wet, it is raining."
3. A proposition in the **nuclear scope** of the modal verb: "It is raining" in sentence (1a).

Therefore the picture of the generalized quantifier approach to modality of Section This paper argues that the analysis of modality in terms of generalized quantification falls short on three issues. First it is shown that such an analysis encounters serious problems when it come to deontic modality. Second I will show that the standard analysis makes false predictions by allowing unwanted combinations of modal items. Third I will argue that the data from Lillooet challenges the position that modality should be analyzed across the board as the interaction of a neutral operator with an externally provided intensional context. Finally I will sketch a solution to those problems within the framework of update semantics. I will propose a polysemous treatment of modality where each modality type (epistemic, deontic and circumstantial) has a distinct meaning.

1 is a generalization of the situation of sentence (1a):

have to [people have wet umbrellas/normal conditions] [It is raining]

The operator determines the modal force (which is encoded in the modal item) of the proposition. For instance, the modal verb 'have to' has universal force and expresses necessity, whereas 'may' is existential and expresses possibility.

Within this framework, the intensional context is the only element able to account for how different types of readings arise. And this is precisely what it is set up to do. The intensional context is made of two different elements, the modal base *b* and the ordering source *o*:

1. The modal base *b* fixes the contextual evidence or circumstances of the evaluation of the modal.
2. The ordering source orders the information contained in the modal base.
3. Both parameters determine together the interpretive class of the modal.

To illustrate this point, I give in the following table an overview of some kinds of modal bases and ordering sources and the interpretive class they refer to.

modal base *b*	**ordering source *o***	**interpretive class**
epistemic: "what is known"	empty	epistemic: (1a)
	stereotypical: "what is normal", "the normal course of events"	
circumstantial: "the relevant circumstances"	"what the law provides" "the hospital regulations" "My mother's orders"	deontic: (1b)
	"what I/you/they want"	bouletic: (1c)
	(possibly empty) stereotypical	circumstantial: (1d)
	"what your/our/their goals are"	teleological: (1e)

Figure 1. Modal base, ordering source and modality type

I will call a theory of modality **strongly context dependent** when modal items like 'have to' have their interpretive class (epistemic, deontic or circumstantial) fixed by the context. Obviously, the analysis just outlined is an example of a strongly context dependent analysis of modality.

I will now briefly introduce the formal theory. The definitions are cast within a possible-worlds semantics framework and aims at giving the conditions under which a modal sentence is true.[1] I will first define the effect of the ordering source: to order a set of propositions.

Definition 1 (Ordering) *W is the set of possible worlds. For any set of propositions P and set of worlds X ⊂W, the ordering* $\leq_P$ *and the set* $max_P(X)$ *are defined as follows.*

1. *For all w,w' ∈ W,*
   $w \leq_P w'$ iff *for all p ∈ P: if p is true in w', then p is true in w.*
   A world w is better than a world w' with respect to P if it makes at least as much propositions from P true as w'.
2. $max_P(X)$*={w ∈ X /for all w' ∈ X: if w'* $\leq_P$ *w then w* $\leq_P$ *w'}.*
   $max_P(X)$ *defines the set of best worlds of X with respect to P.*

Definition 2 (Formal semantics of modality) *For any proposition p, world w, modal base b, and ordering source o.*

1. *Modal bases and ordering sources are functions from worlds to sets of propositions.*
2. *'It must be that p' is true in w relative to b and o* iff
   p is true in all the best worlds determined by b and o in w, i.e. in all the worlds of $max_{o(w)}(\cap b(w))$.[2]
3. *'It can be that p' is true in w relative to b and o* iff
   p is true in at least one of the best worlds determined by b and o in w.

Thus according to Figure (1), an epistemic modal base is a function that associates to a world the propositions that are known in it, i.e.

$b: w \rightarrow$ {*propositions that are known in w*}.

In the same way, a deontic ordering source is a function from worlds to sets of propositions that are provided by the law in these worlds,

$o: w \rightarrow$ {*propositions provided by the law in w*}.

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1. Notice that the definitions are a simplified version of Kratzer (1991) with the limit assumption (Lewis 1973) loosely based on von Fintel and Iatridou (2004).

2. ∩b(w) is the set of worlds determined by the set of propositions b(w): the set of worlds where all the propositions of b(w) are true.

The main idea behind these definitions it is that the truth of modal sentences depends on the truth of non-modal sentences in some other worlds. Recall sentence (1a):

(1) a. [People come inside with wet umbrellas] It has to be raining.

The sentence is epistemic therefore the modal base is epistemic ('what is known') and the ordering source is stereotypical ('what is normal'). We see people entering the building with wet umbrellas, thus this proposition, call it *umbrella* for short, is known and is a part of the modal base b.[3] Furthermore, assume we all know for sure that if people enter the building with wet umbrellas, it is raining. Therefore the conditional proposition, *if umbrella, raining*, is part of the stereotypical ordering source. Assume we are in world w, we have the following situation:

$b(w)=\{umbrella\}$
$o(w)=\{if\ umbrella,\ raining\}$

Sentence (1a) is true in world w with respect to b and o iff,

raining is true in all the worlds of $max_{o(w)}(\cap b(w))$

All the worlds of $\cap b(w)$ are *umbrella*-worlds (i.e. worlds where the proposition *umbrella* is true), and the best worlds are those where the proposition of $o(w)$ is true. But, an *umbrella*-world where *if umbrella, raining* is true is a *raining*-world. Thus sentence (1a) is true in w.

3. Three problems

The generalized quantifiers analysis of modality is both simple and powerful, and it accounts for some puzzling phenomena, such as the apparent polysemy of modal items. However it runs into a couple of problems which I will now present.

3.1 Zvolenszky's problem

This problem was first noticed in sentences involving implication and pertains to the way the contextual information fixes the accessible worlds. I will first present the original argument as developed in Zvolenszky (2002)[4] and then give it a twist to highlight the problem at hand.

3. We don't need to assume that we know more facts for the purpose of his example.

4. A similar argument was developed independently in Frank (1997).

3.1.1 *Original version*

To explain the core of the argument, we have to look at the interplay between modals and conditionals. For instance, the following example involves an epistemic modal and a conditional clause.

(2) If John is home, he must be watching the game.

The intuition about this sentence is that the if-clause restricts the set of best worlds of the modal, i.e. in the assessment of the epistemic modal, I only need to check what is the case in the worlds where the antecedent 'John is home' is true. The following definition formalizes this intuition that the if-clause restricts the domain of quantification of the overt modal.[5]

Definition 3 (Modals and conditionals) *For any propositions p and q, world w, modal base b, and ordering source o:*

1. *'If p, it must be that q' is true in w relative to b and o* iff
   q is true in all the best worlds, determined by b and o in w, that make p true, i.e. in all the worlds of $max_{o(w)}(\cap(b(w) * \{p\}))$.

Zvolenszky (2002) noticed that with this analysis of modality and conditionals, all sentences of the form 'if p, then it must be that p' come out true. It is surely not that problematic in the epistemic case: if John is home, then of course he must be home! However, it does not seem to fit correctly our intuitions about deontic sentences. Consider the following context: we all know that Britney Spears has a contract with the cola brand Pepsi, and this contract has a special clause about drinking cola in public, i.e. sentence (3a) is true due to her engagement with Pepsi.[6] The problem arises when we look at sentence (3b). Intuitively, knowing that sentence (3a) is true, the sentence should be false. However, the analysis provided in 3 predicts this sentence is true and this in virtue of its form alone.

(3) a. If Britney Spears drinks cola in public, she must drink Pepsi.
   propositional form: *If cola, it must be that pepsi*

   b. If Britney Spears drinks Coke in public, she must drink Coke in public.
   propositional form: *If coke, it must be that coke*

How does definition 3 work in this case? First we have to determine the modal base *b* and the ordering source *o*. The sentences in (3) are deontic; the modal base

5. I will restrict the discussion to the definition for *must*.

6. Actually sentence is quite probably a clause of her contract, that is, a part of her contractual obligations. This intuition will turn out to be crucial in Section 4.

b is therefore circumstantial and the ordering source *o* deontic, based on Britney's contract with Pepsi.[7] Assume the actual world is *w*.

1. Sentence (3a) is true in *w* with respect to *b* and *o* if the proposition *pepsi* is true in all the best of the *cola*-worlds, i.e. in $max_{o(w)}(\cap\{cola\})$.
   The *cola*-worlds are worlds where she drinks Coke, Pepsi or any other cola brand. However, the best of those worlds with respect to her contract are *pepsi*-worlds and therefore, proposition (3a) is true.
2. Sentence (3b) is true in *w* with respect to *b* and *o* if *coke* is true in all the best of the *coke*-worlds, i.e. in $max_{o(w)}(\cap\{coke\})$.
   Obviously, the *coke*-worlds are worlds where Britney is drinking Coke. All those worlds violate her Pepsi-contract to some degree but the subset consisting of the best worlds will thus only contain *coke*-worlds. Thereore *coke* will be true in all the worlds of $max_{o(w)}(\cap\{coke\})$ and sentence (3b) is true in *w*.

The natural conclusion from this example is that all the sentences of the form 'if p, then it must be that p' turn out to be vacuously true in this framework (for any proposition *p*, modal base *b*, ordering source *o* and world *w*, it is the case that *p* is true in all worlds of $max_{o(w)}(\cap(b(w) \cup \{p\}))$). This is clearly unwarranted for deontic modality!

3.1.2 *A problem for Zvolenszky?*

Zvolenszky (2002) presents revisions of definition that were proposed in the literature to solve this problem. One of these revised definitions involve the presence of a covert modal operator in the definition of conditionals.[8] The effect of this move is to ensure that sentence (3b) is not trivially true because the proposition of the if-clause is not added to the overt modal base but to the covert one: the sentence is now interpreted as 'if Britney drinks Coke in public, it is because she must drink Coke in public.'

However, this revised definition runs into problems too. In particular, it is not better suited to account simultaneously for sentences (3a) and (3b) than the

7. I will make the same simplifying assumption as Zvolenszky (2002) and assume that the modal base is empty. This means intuitively that there are no particular facts relevant to the situation at hand and that all worlds are considered possible.

8. This revision assumes two separate definitions: one for modality (definition) and one for conditionals, which are now defined with respect to a covert modal base and ordering source (similar to definition without overt modal):
'If p, then *q*' is true in w relative to *b* and *o iff q* is true in all the worlds of $max_{o(w)}(\cap(b(w) \cup \{p\}))$.

original definition. The revised definition encounters problems with sentence (3a) which is intuitively not equivalent to 'if Britney drinks a cola in public, it is because she must drink Pepsi in public.'

	definition 3	**revised definition**
sentence (3a)	true in *w*	#false in *w*#
sentence (3b)	#trivially true#	false in *w*

Geurts (2004) argues that Zvolenszky's problem is actually 'ill-founded' because she fails to recognize that the conditional sentences of the form (3a) and (3b) are ambiguous between an overt (definition 3) and a covert (revision) reading. This ambiguity leads to the fact that two interpretations are possible: in the case of sentence (3b), one trivially true (overt reading) one contingent (covert reading). According to Geurts (2004), a cooperative hearer will then choose to interpret the sentence assuming the informative interpretation, i.e. the covert reading. This may well be, but as it stands, the same explanation is not going to work for sentence (3a). Both readings are informative; they are just not true in the same circumstances!

On the one side, Zvolenszky (2002) proves convincingly that a unified analysis of conditional modals is doomed to be problematic for the deontic case. On the other, Geurts (2004) explains the problem away by arguing that we should not have a unified analysis. The core problem is then to decide when the conditional antecedent restricts the deontic modal base (overt reading) and when not (covert reading).

Although I am sympathetic to Geurts' position, I will now argue that the problem pointed out by Zvolenszky is actually not restricted to conditional environments and thus that Geurts' solution is not adequate.

3.1.3 *Modified version*

Zvolenszky (2002) and Geurts (2004) only looked at conditional sentences whereas the problem of deontic modality is pervasive. The modification of the original argument is meant to show that the problem is not only linked to the definition of conditionals within the standard possible-worlds framework but that it actually relates to the problem of determining the relevant circumstantial evidence for the (deontic) modal.

Consider the following context: A and B are two jurists working for Pepsi. They both know that Britney has a contract with their firm, and they know the terms of the contract. They are watching television when this conversation takes place.

(4) A: Look, Britney is drinking cola in public.
B: [according to her contract] She must drink Pepsi then... Can you see which brand she is drinking?

After A's utterance in Example (4), A and B know that Britney is drinking cola. Intuitively, the sentence uttered by B is true: Britney's contract specifies that she has the obligation to drink Pepsi when she drinks cola in public. According to definition 2 with *w* the actual world,

B's utterance is true in *w iff* the proposition *pepsi* is true in all the worlds of $max_{o(w)}(\cap b(w))$.

The ordering source $o(w)$ is based on Britney's contract with Pepsi. The question is thus whether the modal base contains the proposition *cola* corresponding to A's utterance. The modal base for a deontic modal is a circumstantial one:

$b: w \rightarrow \{$*propositions stating the relevant circumstances in w*$\}$

Suppose $b(w)$ does not contain *cola*, i.e. $cola \notin b(w)$, then some worlds in $\cap b(w)$ will be *cola* worlds and some worlds won't. Obviously Britney's contract does not force her to drink cola (even Pepsi) in public all the time, so there is a world $w_{no_cola} \in \cap b(w)$ where she doesn't drink a cola (and doesn't violate any other part of her contract) that is one of the best worlds, $w_{no_cola} \in max_{o(w)} \cap b(w)$. But in w_{no_cola} she doesn't drink a Pepsi. Therefore, if the proposition *cola* is not in the modal base, B's utterance is false in *w*. Intuitively, B's utterance is true, so by contraposition, *cola* is in the modal base $b(w)$. Thus A's utterance becomes part of the modal base, that is, the relevant facts/circumstances for the evaluation of the deontic modal.[9] But now, consider the conversation was not (4) but instead,

(5) A: Look, Britney is drinking Coke in public.
B: Well, according to her contract, she must drink Coke.

Intuitively, B's utterance is false but with the same reasoning as for Example (4), it is predicted to be true by our formal machinery. The problem is that, this time, adding A's utterance to the modal base does not seem to be warranted for the evaluation of the modal in B's utterance. If we add A's utterance to the modal base, B's utterance become automatically true! The pair of Examples (4) and (5) runs into exactly the same problem as the pair (3a) and (3b) but without any conditional clause involved.

9. Notice that a proposition of the form 'if you drink cola in public, then you drink Pepsi' belonging to the ordering $o(w)$ (i.e. a 'conditional' obligation) would ensure the truth of B's utterance.

Is there a hope to find a way to determine the relevant circumstances in deontic cases (i.e. a way to decide whether a proposition *p* is an element of the modal base or not)? I do not think so.

(6) A: Look, Britney is drinking Coke in public.
B: According to her contract, she must pay a fine! She must not drink Coke in public!

B's utterances in Example (6) seems more likely to be true than not (Britney's contract surely contains a clause about penalties in case of breach and, of course, she is not allowed to drink Coke in public). If we reproduce the same reasoning involved for sentence (4) on B's first utterance (assuming it is true), we obtain that A's utterance is part of the modal base. But then, B's second utterance will be predicted to be false by the framework (under the same modal base and ordering source) which is not warranted. Vice versa, if A's utterance is not a part of the modal base, then B's first utterance is predicted to be false and the second true! A way out would be to assume two different contexts for both modals. However it seems that both sentences are only dependent on the fact stated by A and on the contract between Britney and Pepsi and I do not see any reason why the second modal (i.e. its contextually determined modal base) would neglect A's utterance (other than to make the sentence true).

3.1.4 *Conclusion*

I will conclude this section with two quotes from Zvolenszky (2002). The first resumes nicely the problem we are facing whereas the second gives a hint at its solution.

> "what makes conventional analyses vulnerable [..] is that they equate normative facts with their satisfiability."

That is, Zvolenszky's problem makes obvious that in the case of deontic modality, you cannot at the same time (i) keep track of the contextual dependence on facts (via the modal base) and (ii) check the satifiability of the modal in function of those facts, without running into trouble.

> "Normative facts hold in a possible world solely because they are normative facts of that possible world."

This is indeed what I will try to implement in Section 4.

3.2 Combinations of modals

I will now present the third problem concerning the combinations of modal items. I will argue that the standard framework over generates by allowing sentence (7b).

(7) John may have to pay more taxes.
  a. It might be the case that John has the obligation to pay more taxes.
  b. #It is allowed that John certainly pays more taxes.

Sentence (7) contains two modals: *may* and *have to*. These two modals are notoriously polyfunctional and we could thus expect that this polyfunctionality would cause ambiguities in the interpretation of sentence (7).[10] However, as (7a) and (7b) make clear, it is not the case. In (7a), *may* of (7) is paraphrased with the epistemic *might* and *have to* is paraphrased with the deontic *to have the obligation to*. Similarly in (7b), *may* of (7) is paraphrased with the deontic *to be allowed* and *have to* is paraphrased with the epistemic adverb *certainly*. However, the only interpretation of (7) possible is (7a), i.e. *may* is epistemic and *have to* deontic. Sentence (7b) just does not make any sense. Notice that combinations of modals are not restricted to epistemic and deontic modals or even to combinations of only two modals.

(8) a. (after such a difficult course) They must be able to prove this theorem.
  b. They must be able to prove this theorem (otherwise they won't pass).
  c. You may have to be able to drive.

Sentence (8a) involves an epistemic *must* whereas sentence (8b) has a deontic one; sentence (8c) combines three different modals, two of which are the polyfunctional modals *may* and *have to*. In the same way as for (7), the natural interpretation of sentence (8c) involves an epistemic *may* and a deontic *have to*. All these examples seem to favor the following generalization about the relative scope of modal items.

(9) Semantic scope of modality: Epistemic > Deontic > Circumstantial

Therefore, when some modal items are combined in a sentence, the interpretation follows the scope order of (9): in (7) *may* is epistemic and *have to* deontic.

On the formal side, the standard analysis faces a problem with combinations of modals. Definition 2 doesn't make clear what should happen in case two modals occur in the same construction. The following options seem possible:

1. There is only one modal base b and ordering source o.
2. There are two distinct pairs of modal base and ordering source, one for each modal: (b_1,o_1) and (b_2,o_2).

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10. I will follow van der Auwera, Ammann and Kindt (2005) and call modal items that display the same behavior as 'have to' (i.e. that can be interpreted epistemically, deontically/circumstially) polyfunctional.

Option 1 will not be able to explain the interpretation of sentence (7) as two different interpretive types are present in the salient reading. This leaves us with no other choice than option 2. We can rephrase definition 2 to fit Example (7) as follows:

Definition 4 (Combinations of modals) *For any sentence S (possibly modal), world w, and pairs* b_1,o_1) and (b_2,o_2).

> *'it may be that S' is true in w relative to* (b_1,o_1) and (b_2,o_2) iff
> *S is true in at least one of the worlds of* $max_{o1(w)}(\cap b_{1(w)})$ *with respect to* b_2 *and* o_2.

If we apply this definition to sentence (7), we obtain that (7) is true in world *w* relative to (b_1, o_1) and (b_2, o_2),

> iff there is a world $w' \in max_{o1(w)}(\cap b_1(w))$ where 'John must pay more taxes' is true with respect to b_2 and o_2,
> iff there is a world $w' \in max_{o1(w)}(\cap b_1(w))$ such that 'John pays more taxes' is true in all the worlds of $w' \in max_{o2(w)}(\cap b_2(w'))$.

Assume we have two pairs of contextual parameters (b_1,o_1) and (b_2,o_2) and that one is epistemic and the other deontic. If (b_1, o_1) is epistemic, we obtain reading (7a). If (b_1, o_1) is deontic, we obtain reading (7b). The standard analysis as it stands does not prohibit reading (7b) which is clearly out. The only straightforward solution would be to stipulate somehow that epistemic modals scope over deontic ones which scope over circumstantial ones.

Finally, I would like to conjecture that the scope order presented in (9) is a semantic universal. That is, this scope order is not specific to English but applies to all languages having a rich enough modal system. As such it is a fact that should be accounted for by any theory of modality. But from the previous discussion, we have seen that the standard framework, as it stands, does not account for (9).

3.3 Modality in Lillooet and cross-linguistically

The polyfunctionality of 'have to' (see Example (1)) and, in general, of the other modal verbs was an important incentive for Kratzer (1977) to come up with a unified analysis of modality. The main idea was that at the core, a modal like 'have to' is a neutral (universal) modal that gets its interpretive type fixed from the context (in Kratzer (1991), the type of modality is determined by the intensional context through the interplay of a modal base and an ordering source). However, it is well-known that the English modals have peculiar properties; therefore I will now investigate whether polyfunctionality (and thus strong context-dependence) is a general property of modality or whether it is a property of the English modal verbs. I will first present data from Lillooet, then get back to English, and finally generalize to a cross-linguistic picture.

3.3.1 *Lillooet*

The Lillooet language, also called Sťáťimcets, is a Salish language of British Columbia. Its modal system is mainly based on the use of three second-position enclitics. Lillooet poses a double problem for the generalized quantifier analysis of modality:

1. The enclitics are not polyfunctional but on the contrary, are specialized for a type of modality.[11]

Epistemic	Deontic	Circumstantial
k'a	*ka*	*ka...a*

2. The epistemic and deontic enclitics vary in quantificational force.

These properties are exemplified in the following examples. For instance, the epistemic enclitic *k'a* can express both possibility and necessity,

(10) a. *wáʔ* ***k'a*** *kʷzúsəm*
PROG k'a work
'he must be at work (that's why he's not here).' (van Eijk 1997)

b. *plan* ***k'a*** *qʷacác*
already k'a leave
'Maybe he's already gone.' (Matthewson, Rullmann & Davis 2005)

The deontic enclitic *ka* can express obligation and permission,

(11) *lán-łkaxʷ* ***ka*** *ác'xən* *ti* *kʷtámc-sʷ-a*
already-2S-IND **ka** see-TR DET husband-2S-POSS-DET
'You must/may see your husband now.' (Matthewson, Rullmann & Davis 2005)

Finally, the circumstantial enclitic *ka...a* expresses ability/capacity,

(12) a. ***ka****-álkst-kan-****a***
ka-work-1S-IND-a
'I am able to work.' (Demirdache 1997)

b. *waʔ* ***ka****-gíp-****a*** *ku* *káwkəw* *kəncʔá*
PROG ka-grow-a DET sagebrush DEIC
'Sagebrush can grow around here.' (Matthewson, Rullmann & Davis 2005)

---

11. The enclitic *ka* can also be used as an irrealis marker (in counterfactuals, counterfactual wishes and conditionals (Rullmann, Matthewson & Davis 2006: 14)) but crucially not as an epistemic one.

The important point is that there is no way to force a different interpretation by contextual means: whatever the context in the above examples is, *k̓a* is interpreted epistemically, *ka* deontically and *ka...a* circumstantially.

Note finally that there are other ways to express modal notions in Lillooet, but as for the enclitics, the strong context dependence hypothesis does not seem to be supported as all items express only one type of modality independently of the context (Figure (2)).

	Epistemic	Deontic	Circumstantial
Enclitics	*k̓a*	*ka*	*ka…a*
Adverbs	*sx̌ək* (maybe)		
Verbs	*xʷəc̓ən* (to force, must) *nliʔʷc* (to be allowed)		

Figure 2. Overview of the Lillooet modal system

The conclusion from these data is that, from the point of view of Lillooet semantics, there is not much rationale for formalizing those modals as strongly context dependent modals. Of course, it does not mean it cannot be successfully done. Rullmann, Matthewson and Davis (2006) formalize the *lexical restriction* on the enclitics (Rullmann, Matthewson & Davis 2006: 22–23) as a presupposition on the modal base by saying that the relevant enclitic is only defined if the modal base (and ordering source) provided by the context is of the relevant type. For instance the interpretation of *k̓a* in sentence (10a) is only defined if the modal base is epistemic.

3.3.2 *English*

We have just seen that Lillooet modals do not have a polyfunctional behavior, but it is important to notice that, actually, most English modal itemss (even some modal verbs) behave in this way (see Figure (3)). For instance, *might* is used to

	Epistemic	Deontic	Circumstantial
Modal verbs	***must, have to, can***		
	may, should, ought to		
	might		
Adverbs	*maybe, perhaps, possibly, certainly*	*mandatorily*	
Adjectives	*possible, necessary*	*mandatory,*	
Verbs		*to (be) allow(ed)* *to (be) oblige(d)*	*to be able to*

Figure 3. Overview of the English modal system

express (almost exclusively) epistemic modality; the same holds for adverbs like *maybe* and *perhaps*. Passivized verbs like *to be allowed* or *to be obliged* express deontic modality only.

The bottom line is that, to the exception of (most of) the modal verbs, the English modals are not polyfunctional at all. All those modal elements would thus have to be analyzed in the vain of Rullmann, Matthewson and Davis (2006).

3.3.3 *Cross-linguistic picture*

The problem of polyfunctionality has been investigated from a cross-linguistic perspective in van der Auwera, Ammann and Kindt (2005).[12] In this study, 241 languages (with a sample bias for European languages) have been used and a distinction has been established between three way categories of languages:

1. Fully polyfunctional: the language contains at least one polyfunctional possibility modal and one one polyfunctional necessity modal.
2. Partially polyfunctional: the language contains a polyfunctional modal for either possibility or necessity but not both.
3. Not polyfunctional: there is no polyfunctional modal in the language.

Obviously, English qualifies as a full polyfunctional language whereas Lillooet is not polyfunctional. The following table (van der Auwera, Ammann & Kindt 2005: 255, Table 2) presents the result of this investigation.

	Number of languages
Fully polyfunctional	49
Partially polyfunctional	54
Not polyfunctional	123

More than half of the languages of the sample do not display any polyfunctionality. This can be contrasted with the data from Haspelmath, Dryer, Gil and Comrie (2005, Interactive Reference Tool) for the Indo-European family.

	Number of languages
Fully polyfunctional	21
Partially polyfunctional	8
Not polyfunctional	3

12. I would like to thanks Johan van der Auwera for pointing this out to me.

We can thus conclude with van der Auwera, Ammann and Kindt (2005) that polyfunctionality is typical of European languages (the three non-polyfunctional languages are not European).

3.3.4 *Conclusion*

The data provided in this section shows that, cross-linguistically, only a minority of modal items are polyfunctional.[13] The question is thus whether the strong context dependence analysis of modality can provide a reasonable account of the data. We have seen that the standard analysis can accommodate those issues. Recall the analysis proposed by Rullmann, Matthewson and Davis (2006): non-polyfunctional modals are modeled as strongly context dependent modals with a compatibility restriction on the modal base.[14]

Of course, even though we have noticed that a lot of languages (within a reasonable sample) have no polyfunctional modals at all, this does not prove that the standard analysis would in these cases be misguided (the method of Rullmann, Matthewson & Davis (2006) can be used again). However, I will take this data as an additional incentive not to take polyfunctionality as a core property of modality. In particular, I would like to stress the point that if a theory has to choose between accounting for the pattern of combinations of modals or polyfunctionality (as a consequence of context-dependence), the cross-linguistic data is a good incentive to account for the pattern of combinations.

4. A sketch

We can recapitulate the points conveyed so far and thus, the patterns that need to be formalized. First, Section 3.1 has showed that, although the standard analysis is probably fine for epistemic modality, it is not for deontic modality (in particular, sentence (3a) is true and (3b) is false under Britney's contract). Second, we have

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13. We can further assume with van der Auwera, Ammann and Kindt (2005) that the polyfunctional modals are precisely those that are sensitive to (or involved in) grammaticalization processes (like the English modal verbs).

14. This kind of analysis is also advocated by von Fintel (2006) for non-polyfunctional modals in English:

"This kind of behavior is not uncommon for expressions that are context-dependent: pronouns refer to contextually furnished individuals but may include restrictions on what the context can furnish, for example, the gender marking on *she* requires that the context furnish a female individual."

seen in Section 3.3 that most languages are not polyfunctional and that, in fact, most modal items are not polyfunctional and actually express only one type of modality. Finally, the combinations of modals have been investigated in Section 3.2. The conclusion was that when combined, modal items are interpreted following the scope order of (9). I claim that the ultimate consequence of those problems is that the strong context dependence analysis has to be given up and that, once we drop the strong context dependence hypothesis, we can finally account for all those intuitions. I therefore advocate a polysemous treatment of modality. Each modality type (epistemic, deontic and circumstantial) has a distinct meaning and modal elements can be polysemous. For instance, the modal *must* can express either epistemic or deontic necessity; *may* can express either epistemic or deontic possibility and *might* only expresses epistemic possibility. The polyfunctionality of some modal element is just the fact that this element is polysemous.

I will now give a sketch of an update semantics analysis of epistemic and deontic modality loosely based on Nauze (2008) (which is itself inspired by Veltman (2005, 2007) and Mastop (2005)). The analysis will actually be limited to epistemic possibility and deontic necessity for simplicity and clarity of presentation. For the same reason, I will not provide an account of circumstantial modality and refer the reader to Nauze (2008) for a more complete framework. Those systems all use and adapt in their own way the notion of a **to-do list**.[15] Basically, what I am going to do is to implement Zvolenszky's idea and make deontic facts "normative facts" on their own rights. I will therefore add to the worlds the unit containing the deontic information: a to-do list.

Definition 5 (To-do lists and information states) *Let D be a set of atomic declarative sentences. A* ***to-do list*** δ *is a subset of* $D\times$ *{do, don't}.*

We will call a to-do list δ ***consistent*** *if and only if there is no sentence p such that* $(p, do) \in \delta$ *and* $(p, don't) \in \delta$.

Finally an ***information state*** σ *is a non-empty set of pairs consisting of a world and a to-do list, i.e.* (w, δ) *with* $w \in W$. *The minimal information state* $\mathbf{0}$ *consists of all the pairs of a word and the empty to-do list (you do not know which world is the case and you do not have any deontic information):* $\mathbf{0}=\{(w,\varnothing) \mid w\in W\}$ *and the absurd state is denoted by* $\mathbf{1}$.

The to-do list is thus meant to represent the duties at hand at a world. The difference with the standard framework is actually minimal but decisive. Basically, in the standard analysis we associate to a world w, a set of 'duties' $o(w)$ that orders

15. This notion is also used in truth-conditional frameworks as in Portner (2003) for instance.

the accessible worlds $\cap b(w)$; in the new framework, we give up the idea of interpreting deontic modality as 'truth in some accessible worlds' (as suggested by Zvolenszky, 2002) and analyze deontic facts as normative facts about a world.

The framework is an update system, therefore we do not assess the truth of propositions in worlds as before but we update information states with those propositions. The major change with traditional update semantics is that the framework is partly additive (for deontic sentences) and not only eliminative.[16] We need two different updates: a positive update $\uparrow$ and a negative update $\downarrow$.

Definition 6 (Update of information states) *Let σ be an information state and p,q some atomic declarative sentences and φ,ψ sentences. If the result of the update is not empty,*

- *Atomic sentences:*
  $\sigma\uparrow p=\{(w, \delta) \mid (w,\delta) \in \sigma \,\&\, p \in w\}$
  $\sigma\downarrow p=\{(w, \delta) \mid (w, \delta) \in \sigma \,\&\, p \in w\}$.
- *Negation:* $\sigma \uparrow\neg\varphi=\sigma \downarrow\neg\varphi$ *and* $\sigma\downarrow\neg\varphi=\sigma\uparrow\varphi$.
- *Conditionals:* $\sigma\uparrow$*if* $\varphi, \psi=\sigma\downarrow\varphi\cup\sigma\uparrow\varphi\uparrow\psi$.
- *Epistemic possibility:*
  $\sigma\uparrow$*might* $\varphi=\sigma\cup\sigma\uparrow\varphi$*if* $\sigma\uparrow\varphi=\emptyset$, *Ø otherwise.*
- *Deontic necessity:*
  $\sigma\uparrow$*must* $\varphi=\{(w,\delta\uparrow\varphi) \mid (w,\delta)\in \sigma \,\&\, \delta\uparrow\varphi$ *consistent}.*

otherwise the update leads to the absurd state ***1****.*

The positive update with a simple declarative eliminates the pairs (w,δ) with a world *w* where the sentence does not hold whereas the negative update eliminates the pairs with a world where the sentence holds. This part of the system is eliminative. Negation just switches between a negative and a positive update. The positive update with a negation is a negative update with the embedded sentence. The definition of conditionals is an adaptation of the material implication for an additive update semantics.[17] Finally, epistemic modality is just a test as in Veltman (1996) in case it has scope over (boolean combination of) simple declaratives. Otherwise it can add alternative pairs to the information state. Deontic modals operates on

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16. I will only define updates for simple declarative sentences (propositions), negated sentences, conditionals, epistemic possibility and deontic necessity and refer the reader to Nauze (2008) for other boolean combinations.

17. In this system, we have the following equivalence: *if* $\varphi, \psi\equiv\neg\varphi\vee(\varphi\wedge\psi)$ (which is truth-conditionally equivalent to $\neg\varphi\vee\psi$). Furthermore, the positive update with conjunction is just the sequential update of the conjuncts and the positive update with disjunction is the union of the respective updates of the disjuncts.

the to-do list of the pairs in the information state. We thus need to define the update of to-do lists.

Definition 7 (Update of to-do lists) *Let δ be a to-do list, p an atomic declarative sentence and φ a sentence.*

- *Atomic sentences:* $\delta\uparrow p = \delta \cup \{(p, do)\}$ *and* $\delta\downarrow p = \delta \cup \{(p, don't)\}$.
- *Negation:* $\delta\uparrow\neg\varphi = \delta\downarrow\varphi$ *and* $\delta\downarrow\neg\varphi = \delta\uparrow\varphi$.

A deontic modal thus adds its embedded information to the to-do lists of the information state and therefore increases the knowledge about what has to be done or is prohibited. Obviously the increase is only possible if it is consistent: we cannot add to the to-do lists contradictory duties.

On the one hand the definition of deontic modality acknowledges that obligations are facts of the worlds and not things happening in some accessible worlds. On the other hand epistemic modals operate on whole information states whereas deontic modals operate on to-do lists. I will now run through the examples of Sections 3 and 3.2, to show the predictions this system makes. The reader should however note that the system so far is only a toy example and that much more is needed to turn it into a full-fledged update system.

4.1 Britney again

Now we can capture the meaning difference between the two following sentences of Example (3). Contrary to the standard framework, sentence (13b) is not tautological anymore.

(13) a. If Britney Spears drinks cola in public, she must drink Pepsi.
b. If Britney Spears drinks Coke in public, she must drink Coke in public.

Assume for simplicity that the information state is the minimal information state **0** and we learn about the nature of Britney's contract. I will first show in detail what it means to update with sentence (13a) according to definitions 6 and 7:

$$
\begin{aligned}
& \mathbf{0}\uparrow \textit{if cola, must pepsi} \\
= \; & \mathbf{0}\downarrow \textit{cola} \cup \mathbf{0}\uparrow \textit{cola}\uparrow \textit{must pepsi} && \text{(Conditionals in 6)} \\
= \; & \{(w,\varnothing) \mid (w,\varnothing) \in \mathbf{0} \;\&\; \textit{cola} \notin w\} \cup && \text{(Atomic sentences in 6)} \\
& \{(w,\varnothing) \mid (w,\varnothing) \in \mathbf{0} \;\&\; \textit{cola} \in w\}\uparrow \textit{must pepsi} \\
= \; & (w_{\neg \textit{cola}},\varnothing) \mid (w_{\neg \textit{cola}},\varnothing) \in \mathbf{0}\} \cup && \text{(Deontic necessity in 6)} \\
& \{(w_{\textit{cola}},\varnothing \uparrow \textit{pepsi}) \mid (w_{\textit{cola}},\varnothing) \in \mathbf{0} \;\&\; \varnothing\uparrow \textit{pepsi} \text{ consistent}\} \\
= \; & \{(w_{\neg \textit{cola}},\varnothing) \mid (w_{\neg \text{cola}},\varnothing) \in \mathbf{0}\} \cup && \text{(Atomic sentences in 7)} \\
& \{(w_{\textit{cola}},\{(\textit{pepsi,do})\}) \mid (w_{\textit{cola}},\varnothing) \in \mathbf{0}\}
\end{aligned}
$$

Therefore after the update with sentence (13a) we consider two kinds of situations, either (i) Britney is not drinking a cola or (ii) she is drinking a cola and she has the

obligation to drink a pepsi. Obviously, in this framework, having the obligation to drink a pepsi does not mean she is drinking one. The update of the minimal information state with sentence (13b) gives the following result:

$$\begin{aligned} & \mathbf{0}\uparrow \textit{if coke, must coke} \\ = \; & \{(w,\varnothing) \mid (w,\varnothing) \in \mathbf{0} \;\&\; \textit{coke} \notin w\} \cup \\ & \{(w,\{(\textit{coke},\textit{do})\}) \mid (w,\varnothing) \in \mathbf{0} \;\&\; \textit{coke} \in w\} \\ = \; & \{(w_{\neg \textit{coke}},\varnothing) \mid (w_{\neg \textit{coke}},\varnothing) \in \mathbf{0}\} \cup \\ & \{(w_{\textit{coke}},\{(\textit{coke},\textit{do})\}) \mid (w_{\textit{coke}},\varnothing) \in \mathbf{0}\} \end{aligned}$$

The sentence thus means that either (i) Britney is not drinking a Coke or (ii) she is drinking one and she has to! That is, she is only drinking Coke if she has to do it.[18] Therefore both sentences induce distinct but non-trivial information states.

To account for the modified Examples (4) and (5) notice first that sentence (13a) does not characterize all the requirements of Britney's contract. For instance, another requirement is that Britney must not drink Coke in public:

$$\begin{aligned} & \mathbf{0}\uparrow \textit{if cola, must pepsi} \uparrow \textit{if cola, must} \neg \textit{coke} \\ = \; & \{(w_{\neg \textit{cola}},\varnothing) \mid (w_{\neg \textit{cola}},\varnothing) \in \mathbf{0}\} \cup \\ & \{(w_{\textit{cola}},\{(\textit{pepsi},\textit{do}), (\textit{coke},\textit{don't})\}) \mid (w_{\textit{cola}},\varnothing) \in \mathbf{0}\} \end{aligned}$$

In both example examples (4) and (5) we then learn that Britney is drinking cola in public (in (5) we learn the more specific brand but that does not change the reasoning). We thus obtain the following information state:

$$\begin{aligned} & \mathbf{0}\uparrow \textit{if cola, must pepsi} \uparrow \textit{if cola, must} \neg \textit{coke} \uparrow \textit{cola} \\ = \; & \{(w_{\textit{cola}},\{(\textit{pepsi},\textit{do}), (\textit{coke},\textit{don't})\}) \mid (w_{\textit{cola}},\varnothing) \in \mathbf{0}\} \end{aligned}$$

This information state we already know that she must drink a Pepsi and not a Coke. As such updating this state with B's utterance in (4) does not change the information state. However B's answer in (5) cannot be accepted in this state as the update leads to the absurd state (none of the to-do lists would be consistent anymore):

$$\begin{aligned} & \mathbf{0}\uparrow \textit{if cola, must pepsi} \uparrow \textit{if cola, must} \neg \textit{coke} \uparrow \textit{cola} \uparrow \textit{must coke} \\ = \; & \{(w_{\textit{cola}},\{(\textit{pepsi},\textit{do}), (\textit{coke},\textit{don't})\}) \mid (w_{\textit{cola}},\varnothing) \in \mathbf{0}\} \uparrow \textit{must coke} \\ = \; & \{(w_{\textit{cola}},\{(\textit{pepsi},\textit{do}), (\textit{coke},\textit{don't})\} \uparrow \textit{coke}) \mid (w_{\textit{cola}},\varnothing) \in \mathbf{0} \;\& \\ & \{(\textit{pepsi},\textit{do}), (\textit{coke},\textit{don't})\} \uparrow \textit{coke} \text{ consistent}\} \\ = \; & \mathbf{1} \end{aligned}$$

as $\{(\textit{pepsi},\textit{do}),(\textit{coke},\textit{don't})\}\uparrow\textit{coke}=\{(\textit{pepsi},\textit{do}),(\textit{coke},\textit{don't}),(\textit{coke},\textit{do})\}$ is never consistent.

---

18. Obviously we would like that the update with sentence (13b) after an update with (13a) leads to the absurd state, i.e. you should not accept the information contained in (13b) if you know the nature of Britney's contract with Pepsi. This does not follow from the system at this point. I am afraid I will again have to refer the reader to Nauze (2008) for a system that can account for this fact.

4.2 Combinations revisited

Recall sentence (7). We argued that this sentence has only one possible reading when combining an epistemic and a deontic operator which is that the epistemic modal has scope over the deontic one.[19] Therefore *may* is interpreted epistemically and *have to* deontically.

(7) John may have to pay more taxes.

$$
\begin{aligned}
& \mathbf{0}\uparrow \textit{might must pay} \\
= \ & \mathbf{0} \cup \mathbf{0}\uparrow \textit{must pay} \qquad\qquad \text{if } \mathbf{0}\uparrow \textit{must pay} \neq \varnothing \\
= \ & \mathbf{0} \cup \{(w, \varnothing\uparrow \textit{pay}) \mid w \in W \ \& \ \varnothing\uparrow \textit{pay} \text{ consistent}\} \\
= \ & \{(w, \varnothing) \mid w \in W\} \cup \{(w,\{(\textit{pay},\textit{do})\}) \mid w \in W\}
\end{aligned}
$$

In this new information state the uncertainty about John having to pay more taxes is captured by the fact that for ant world $w \in W$, we don't know which one of $(w,\varnothing)$ or $(w,\{(\textit{pay},\textit{do})\})$ is the case: both alternatives are entertained.

To illustrate the prediction of the scope order within this framework (with only deontic necessity and epistemic) we need a sentence where the first modal is a necessity and the second a possibility, both being polyfunctional. It is difficult to respect both constraints with a natural sounding English sentence:

(14) It must be so that Britney may drink a Coke.

Now we can give the two reasons why this sentence cannot be interpreted as having a deontic necessity above an epistemic possibility. First, epistemic possibility is an information state operator: it operates on whole information states. Second, deontic necessity operates on to-do lists, i.e. locally inside the world/to-do lists pairs. Therefore, epistemic modality is a global notion whereas deontic modality is a local one and one cannot have obligations about uncertainty.

$$
\begin{aligned}
& \mathbf{0}\uparrow \textit{must might coke} \\
= \ & \{(w, \varnothing\uparrow \textit{might coke}) \mid w \in W \ \& \ \varnothing\uparrow \textit{might coke} \text{ consistent}\}
\end{aligned}
$$

Notice that the update does not lead to the absurd state (as is the case of an update with inconsistent information) but its execution fails. This explains why the sentence is not judged as false but cannot be interpreted.

5. Conclusion

The goal of this article was to present some serious shortcomings of the standard generalized quantifier approach to modality. I argued that these shortcomings are

19. I will disregard the eventual deontic-deontic reading.

inherently linked to the implementation of strong context dependence (modal items have their interpretive class fixed by the context). The reason to implement strong context dependence is to account for polyfunctional modal items like the English modal verbs, however, it has been shown that this category of modal elements is certainly not the norm cross-linguistically (and is even marginal within a lot of languages). Furthermore the framework does not account for the phenomenon of modal combinations which seems to be a semantic universal. All in all, I will thus conclude that we should give up the strong context dependence view of modality and, for instance, use an update semantics framework that allows polysemy of modal elements and accounts for the scope order of modal combinations.

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Verbal semantic shifts under negation, intensionality, and imperfectivity

Russian genitive objects*

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The Russian Genitive of Negation construction involves alternations of genitive with nominative or accusative case under negation; typically a genitive NP is interpreted as "weaker" than a corresponding nominative or accusative, having narrow scope with respect to negation and as lacking any existence presupposition. A similar alternation is found with some intensional verbs, with genitive (sometimes) used for the "opaque" reading of the direct object. The similarity among these uses of genitive for 'less referential' objects was observed by Neidle (1982). One challenge for compositionality is the apparent non-uniformity of the semantics: the case alternations often have semantic correlates, but not always; when they do, the semantic correlates are not self-evidently the same in each case. We believe that a solution might be approached by combining the Russian "verb-centered" view of the phenomena with the western "compositionality-centered" view. As a prolegomenon to a fuller study of shifts in semantics and in fine-grained argument structure of verbs under negation and under the influence of intensionality, modality, and imperfective aspect, in this paper we examine the relationships between negation and intensionality and between partitivity and imperfectivity.

*This work was supported in part by the National Science Foundation under Grant No. BCS-0418311 to Partee and Borschev for the project, "The Russian Genitive of Negation: Integration of Lexical and Compositional Semantics", 2004–08. We are grateful for valuable discussion and comments to audiences where this and related work was presented, at Smith College and at the University of Canterbury, and at the TAM TAM workshop. We are grateful to Elena Paducheva, Ekaterina Rakhilina, Yakov Testelets, and Igor Yanovich for joint work from which many of the ideas discussed here emerged, to Olga Kagan for discussion of related ideas in her work, to Dmitry Levinson for sharing his relevant work in progress with us, to Susan Rothstein and Hana Filip for valuable comments on drafts of the paper Partee (2008), which overlaps substantially with this paper, and to two anonymous referees. None of those mentioned is responsible for the ideas expressed.

1. The puzzle of the relation between negation and intensionality

The Russian "Genitive of Negation" (GEN NEG) construction involves substituting genitive case for accusative (on objects) or nominative (on non-agentive subjects) of many verbs when the whole sentence is negated (Borschev & Partee 2002; Partee & Borschev 2002, 2004). The construction raises many puzzles, and has been the subject of intensive research for over a century (Babby 1980, 2001; Ickovič 1974; Neidle 1982, 1988; Padučeva 1992, 1997; Perlmutter 1983; Pesetsky 1982; Peškovskij 1956; Timberlake 1975; Tomson 1903). Most researchers have held that a genitive-marked NP under negation, as in (1b) below, is an indication that the NP has narrow scope with respect to negation,[1] much like the choice of polarity *any* under negation in English.

(1) a. *On ne polučil pis'mo.*
he NEG received letter-***ACC.*** N.SG
'He didn't receive the (or 'a specific') letter.'

b. *On ne polučil pis'ma.*
he NEG received letter-***GEN.*** N.SG
'He didn't receive any letter.'

It was pointed out by Neidle (1982, 1988) that genitive case is also used to mark opaque objects of certain intensional verbs (although not all, and there is variability in whether it is optional or obligatory).

(2) a. *On ždet podrugu.* (Neidle 1988: 31)
He waits girlfriend-ACC
'He's waiting for his girlfriend.' (transparent, NP *de re*)

b. *On ždet otveta na vopros.*
He waits answer-GEN to question
'He's waiting for an answer to the question.' (opaque, NP *de dicto*)

The puzzle is: why is the same case marking used for both? Negation is not intensional, so why should negation and intensionality pattern together, as they do in a number of phenomena such as the licensing of genitive just seen, and the licensing of subjunctive (Section 3.4)? Is this just coincidence, or is there some generalization to be uncovered?

In this paper, we focus on objects, since the intensionality phenomena concern only objects; we believe what we say here about objects is consistent with the treatment of Subject GEN NEG in our earlier papers (Borschev & Partee 2002; Partee & Borschev 2002, 2004). This paper explores the question of why genitive

1. But the exceptions discussed in (Partee & Borschev 2002) have yet to be resolved.

case might mark negative indefinites and the objects of some intensional verbs in Russian. Both positions have narrow scope relative to some operator (negation or intension), but not all narrow scope NPs are marked as genitive. Rather it appears that some additional semantic property is involved in the genitive marking, and this property is tentatively associated with being 'less referential', or having less/no existential commitment. The paper relates the issue to the more general questions of why cross-linguistically some less referential NPs are morphologically marked, and how a language might 'decide' which NPs are so marked. The connection between indefiniteness and imperfective aspect is explored.

In Section 2, we note two other constructions in which such semantic distinctions in relations between NPs and certain operators are signaled by morpho-syntactic means in various natural languages. In Section 3 we consider some hypotheses about the interactions among scope, NP interpretation, and the semantic properties of negation and intensional operators. Section 4 brings aspect into the picture, drawing especially on recent works by Paul Kiparsky and by Dmitry Levinson. In Section 4.1 we discuss Kiparsky's study (Kiparsky 1998) of parallels between partitive case in Finnish and imperfective aspect in Russian, and explore the possibility that Finnish partitive, Russian imperfective, and Russian genitive have semantic similarities that may be described in terms of 'decreased referentiality'. In Section 4.2 we adapt some arguments from Dmitry Levinson's work on a slightly different kind of parallel between imperfectivity and genitive case under negation, to further support the idea of similarity between NPI contexts and intensional contexts. In the concluding section we opt for a view of "family resemblance" properties that many but not all instances of negation and intensionality share, so as to allow for equally important differences that show up among the family members (Section 5).

2. Natural language patterns – strategies of marking different interpretations differently

An ambiguous sentence or construction in one language may or may not translate into an ambiguous sentence or construction in another. In this section we note the use of the subjunctive/indicative distinction in Romance relative clauses to express opaque vs. transparent readings of objects of intensional verbs (Section 2.1) and the existence of negative and positive polarity items that yield unambiguous interpretations of some negative sentences in English (Section 2.2). These two phenomena share some properties with the alternation of Russian genitive case with accusative case, which, as described in Section 1, serves a similar disambiguating function, both with negation and with intensional verbs.

2.1 Marking opacity with subjunctive

The English example (3a) is ambiguous. One can find unambiguous paraphrases by changing the wording in various ways (e.g. with *a certain* or *any*), but the simple sentence is ambiguous. There are languages in which various obligatory grammatical markings split such sentences into unambiguous pairs, such as the Romance languages; consider the Spanish translations of (3a) given in (3b–c):[2]

(3) a. *Mary is looking for a professor who teaches Greek*. (ambiguous)

b. *María busca a un profesor que enseña griego*. (transparent)
Maria looks-for a professor who teaches-INDIC Greek.

c. *María busca (a) un profesor que enseñe griego.* (opaque)
Maria looks-for a professor who teaches-SUBJUNC Greek.

In Spanish, neither sentence is ambiguous in the way that (3a) is: in many intensional contexts Spanish makes the embedded verb in the relative clause subjunctive, vs. indicative in all extensional contexts. (But with a simple NP with no relative clause, like "a tall professor", the corresponding Spanish sentence *is* ambiguous. And conversely we note that while English has nothing as uniform as the Spanish subjunctive, some expressions like 'any old' or 'any … whatever' do demand an intensional context).[3]

There are many theories of the semantics of the subjunctive, in many cases relating the subjunctive fairly directly to 'alternative possible situations'(Farkas 1982; Giannakidou 1994, 1995; Portner 1992). But no existing formal tools have yielded a direct account of the semantics of the subjunctive, and it remains a lively topic of debate.

2.2 Negative polarity items

English and many other languages have expressions that can occur in "negative contexts" but not in simple affirmative ones. The actual distribution of these Negative

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2. Thanks to Maribel Romero and Paula Menéndez-Benito for checking the Spanish data. Paula uncovered some interesting Google data about the optionality of the preposition "a" in (3c). While both Paula and Maribel reported the "a" as simply optional in their own dialects when the verb is subjunctive, i.e. on the opaque reading, Paula's Google data indicated that the use of "a" is relatively rare with the subjunctive.

3. Susan Rothstein (p.c.) notes that at least in British English, *would* may be used in opaque contexts in a way that seems parallel to the use of the Spanish subjunctive: (i) Susan was looking for a professor who would teach Greek. (opaque); (ii) Susan was looking for a professor who taught Greek. (ambiguous).

Polarity Items (NPIs), words like *any, ever, at all,* has been the subject of decades of research; the discovery that a large part of the distribution of NPIs in English could be accounted for with the notion of *monotone decreasing functions* (Ladusaw 1980) was probably the first achievement in linguistic work in formal semantics that made use of essentially model-theoretic properties of meanings, properties that had no syntactic or "LF" counterpart expressible with tree geometry or "semantic features".[4] Subsequent work by Ladusaw and others has uncovered additional model-theoretic properties that help account for differences among different NPIs within and across languages (Giannakidou 1998; Hoeksema 1986; Kadmon & Landman 1993; Kanazawa 1994; van der Wouden 1997), as well as the interplay with pragmatic and syntactic factors (Hoeksema 2000; Krifka 1994, 1995; Ladusaw 1996; Linebarger 1987; Progovac 1994).

The existence of these NPIs gives English minimally contrasting unambiguous pairs:

(4) a. *Bill didn't answer some of the questions.* (∃ > NOT: there are some he didn't.)

b. *Bill didn't answer any of the questions.* (NOT > ∃: there aren't any that he did)

These NPIs are not signaling intensionality, since negation is not an intensional construction. But their role seems in a certain sense analogous to that of the subjunctive in marking intensionality in Spanish. And given the way the genitive case alternations in Russian illustrated in Section 1 arise both under negation and in intensional contexts, we may wonder how deep the parallels between negation and intensionality may be. We turn to the question of these parallels in Section 3.

3. Hypotheses

The puzzles of the Russian genitive may be considered as part of a wider question: Which phenomena may pattern together with respect to morphosyntactic disambiguation across languages, and why? Here we draw on (Partee 2008) and

4. For introductory expositions of this notion, see (Ladusaw 1980; Larson 1995; Partee et al. 1990).

(Borschev et al. 2008) to consider some possible directions for an answer with respect to the Russian genitive.[5]

3.1 Scope differences

On the classical linguistic view, both kinds of phenomena illustrated above are simply scope phenomena: an NP, if it is not unambiguously referential (*this horse*), may have wider or narrower scope than a given operator, as illustrated in the glosses above.

Each operator has its own semantics – intensional verbs, negation, tenses, quantifiers, adverbs, etc. On this view the meaning of the operator stays fixed, the meaning of the NP stays fixed, and the only thing that varies is the relative scope of the two.

This captures part of the core of the phenomenon, a piece which needs to be captured by any account. But if one stops here, we make no predictions about which ambiguities get distinguished by some sort of morphosyntactic marking in some languages, nor about which phenomena most often pattern together across languages.

In the case of the Russian genitive, for instance, the only NPs that can be genitive in the GEN NEG and Genitive of Intensionality constructions are NPs which would otherwise be nominative or accusative, and this genitive marking can happen only to nominative subjects and accusative objects under the scope of sentential negation or under the scope of a transitive intensional verb. It does not happen to NPs that fall under the scope of a quantifier, nor in infinitival complements of modal verbs, nor under a modal adverb. And in some (not all) GEN NEG environments, it is possible for a proper name or deictic pronoun to occur in the genitive, even though it would be conventionally said that such elements are scope-invariant. Brown is one of a number of Slavists who have argued that GEN NEG must be syntactically licensed by sentential negation but is not always semantically interpreted as under the scope of a real semantic negation (Brown 1999; Brown & Franks 1997). It is argued in (Borschev et al. 2008), however, that even with proper nouns, the GEN/ACC alternation may have semantic significance, with genitive marking a shift of the denotation to property type.

3.2 Possible non-uniform NP meanings

On some recent approaches, it is suggested that the NP meanings may not be constant: some NPs are "licensed", in form and/or meaning, by operators governing

5. See also the very interesting proposals in (Kagan 2007), which reached us while the present paper was already under editorial review.

them. This hypothesis is particularly appealing for constructions involving direct objects of transitives verbs (and subjects of unaccusatives), where one is most likely to find special markings analogous to the Russian Genitive of Negation, e.g. "object incorporation" in Greenlandic Eskimo, with obligatory narrow-scope interpretation (Bittner 1987; van Geenhoven 1998), accusative-partitive alternation in Finnish (Kiparsky 1998) (more on this in Section 4), and related phenomena in Turkish (Enç 1991) and other languages.

All such proposals have in common that accusative-marked NPs are higher on some kind of scale(s) of referentiality and topicality than object NPs that are marked with some oblique case like genitive or Partitive or not marked at all. There appears to be a correlation between NPs that are "good, canonical subjects or objects" and have more highly "referential" interpretations, and NPs that are in some sense "demoted" from canonical subject or object position and have "weak" interpretations. But as Aissen (2003) emphasizes, different languages draw different distinctions; some languages pay attention to scales of animacy, some to scales of referentiality, some to both, and where they draw 'cutoff lines' varies from language to language.[6] In some early work, the condition for the Russian GEN NEG was said to be that a genitive-marked NP must not only be under the scope of negation but must be indefinite (Babby 1980); an alternative recent hypothesis is that GEN NEG NPs must be non-specific (Babyonyshev & Brun 2002).

A number of authors, including Pesetsky (1982) and Pereltsvaig (1999), have taken the fact that the GEN NEG construction is almost invariably found under the relatively local scope of sentential negation (but see Partee & Borschev 2002) as grounds for seeking to assimilate it to negative polarity phenomena. Pesetsky suggests that the GEN NEG construction reflects the presence of a null NPI quantifier (analogous to English *any*), which itself occurs in the nominative or accusative, and which, like many other Russian quantifiers, governs the genitive case in its complement. Pereltsvaig extends Pesetsky's analysis to explain the interactions between GEN NEG and aspect. These analyses have plausibility in the prototypical cases but face some difficulties when the NP in the GEN NEG construction is a pronoun or a definite NP headed by a demonstrative or an explicit quantifier.

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6. There is also a great deal of interesting current work on different kinds of indefinite pronouns across languages and the nature of the differences among them. Where English distinguishes *someone* from *anyone*, Russian has half a dozen different forms different meanings and different distributions. See (Haspelmath 1997; Kratzer & Shimoyama 2002; Yanovich 2005, 2006). Pereltsvaig's work draws explicit connections between this range of indefinites in Russian and the various kinds of polarity contexts, particularly examining the differences between non-veridical operators and monotone decreasing operators (Pereltsvaig 2000, 2004).

3.3 Property types and other "demotions" of NPs

Some formal semanticists have proposed that the actual semantic "type" of NPs changes in some of these constructions (Borschev et al. 2008; Kagan 2005; Partee & Borschev 2004; van Geenhoven 1998; Zimmermann 1993). On this view, "canonical" NPs are either simply referential (type e), like names, demonstratives, most personal pronouns, and some definite descriptions, or else quantificational ("generalized quantifiers" in the work of Montague (1973), Lewis (1970) and Barwise & Cooper (1981)). "Opaque" objects of intensional verbs, however, as in (3a), are interpreted as *properties*, the type normally associated with predicates rather than with argument-position NPs (Partee 1986).

Zimmermann (1993), one of the first to make such a proposal, advanced the hypothesis that opaque objects of intensional verbs have property type rather than entity type or generalized quantifier type. He argued that such an analysis can explain several things, of which two are central. The first is the obligatory narrow scope of opaque objects: since on his proposal they are never true quantifiers, they can never take "optional wide scope" as true quantifiers usually can. And secondly, his analysis can account for often-noted but never explained restrictions on the kinds of NPs that can be interpreted opaquely. Many NPs, both definite and indefinite, can get both *de dicto* and *de re* readings. But those NPs which are most obligatorily quantificational, like *each student, most students*, are most resistant to getting any *de dicto* or 'opaque' reading under an intensional verb. This is seen in example (5) from Zimmermann (1993), where we see it is impossible to get a 'narrow scope' *de dicto* reading with a quantificational object of the verb *seek*.

(5) a. *Alain is seeking a comic book*. (ambiguous)
b. *Alain is seeking each comic book*. (unambiguous; lacks ambiguity of (c))
c. *Alain is trying to find each comic book*. (ambiguous).

The fact that both readings are available in (5c), where the opaque context is created not by an intensional transitive verb but by an infinitive-embedding construction which provides a locus for a simple scope ambiguity, provides a further argument for treating verbs like *seek* as taking a non-standardly interpreted NP complement. If we assume that the embedded verb *find* in (5c) takes normal e-type or generalized quantifier objects, then the ambiguity of (5c) is ordinary scope ambiguity.[7]

7. This might seem to challenge Montague's meaning postulate (Montague 1973) which says that *seek* is equivalent to *try to find*, but that meaning postulate could be reformulated for Zimmermann's version of *seek* so that it says, in effect that 'to seek property P' is 'to try to find something that has property P'. Then we get the same equivalence but limited to the kinds of NPs that occur as complements of *seek*, namely those that can be given a property interpretation.

But what about negation? So far we have seen several ideas for the treatment of opaque objects of intensional verbs, but none that extend in a straightforward way to negation, which is a sentence-level operator and not an intensional one. Giannakidou (1994, 1998), looking especially at Greek, which also shows commonalities in the marking of NPIs under negation and of opaque objects of intensional verbs, suggested that some languages take the main semantic property of NPI-licensing constructions to be not downward monotonicity but *nonveridicality*.[8]

The fact that some NPs can occur only in non-veridical contexts (*any student, the slightest sound*) increases the plausibility of the conjecture that some NPs (*a student*) may have a "less referential" meaning in a non-veridical context than they do in a veridical context, whether that notion of "less referential" is to be cashed out in terms of a shift to property type or in some other way.

The use of the notion of nonveridicality offers one promising answer to the question of what negation and the intensional verbs have in common: both are non-veridical operators. At the same time it is just one semantic property, not a unifying "category", so it leaves open the expectation that other properties distinguish negation from intensional contexts.

3.4 Or coincidence?

Of course, it is also possible that it is mere coincidence that the same morphological case is used in Russian to mark NPs to be interpreted under the scope of a negative operator and NPs to be interpreted under the scope of an intensional verb (the latter far from uniformly, at that). Or, more likely it could be something more than coincidence but less than a very deep connection.[9] Not all intensional contexts are in fact non-veridical, although they "typically" are. While veridical intensional operators (like *know*, *necessarily*, debatably *identify*) are less likely than non-veridical ones (like *suspect, possibly, seek, want*) to take subjunctive sentential

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8. Let *Op* be a monadic propositional operator. Then:

(i) *Op* is *veridical* just in case $Op\ p \rightarrow p$ is logically valid. Otherwise *Op* is *nonveridical.*
(ii) A nonveridical operator *Op* is *antiveridical* just in case $Op\ p \rightarrow \neg p$ is logically valid.

Yesterday is a veridical operator, *perhaps* is nonveridical, and *not* is antiveridical.

9. Thanks to Diane Proudfoot for pushing the first author on these points in discussion at a Philosophy Department Seminar at the University of Canterbury in 2006, and to Andrew Carstairs-McCarthy for suggesting that a 'family resemblance' account might be more successful than a search for a single unifying factor.

complements or subjunctive relative clauses in NP complements in the Romance languages or to take genitive NP objects in Russian, it is certainly not the case that all and only non-veridical operators license subjunctive in Romance or genitive NPs in Russian.

Certainly one does not want to claim that the connection is too deep, or it would be surprising not to see clearer evidence of it across the world's languages; NPIs and 'intensional-polarity' items may have some non-accidental degree of resemblance but as far as my limited knowledge goes, they are far from identical in general.[10]

But further evidence of non-accidental similarity in Russian and Romanian comes from facts noted by Farkas (1985) and Kagan (2006), both of whom make the non-standard suggestion that negation *is* an intensional operator.[11] Farkas observed that negation in Romanian can sometimes license a subjunctive relative clause on an NP under the scope of negation, as in (6), and Kagan showed that the same holds for Russian, as in (7b).[12]

(6) *În România nu există oameni care să creadă în el.* (Farkas 1985: 128)
In Romania not exist people who SUBJUNC believe in him
'In Romania there are no people who believe in him.'

(7) a. *#Ja videl čeloveka, kotoryj by sčital inače.* (Kagan 2006: 3)
I saw man-ACC that SUBJUNC consider differently
'I have seen a man that thinks otherwise.'

b. *Ja ne videl čeloveka, kotoryj by sčital inače.*
I NEG saw man-ACC/GEN that SUBJUNC consider differently
'I haven't seen a man that would think otherwise.'

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10. A suggestive but not conclusive indication of their similarity across languages can be taken from the diagrams developed by Haspelmath in his typological study of kinds of indefinite pronouns (Haspelmath 1997). Contexts that correspond approximately to NPI contexts and contexts that reflect various sorts of intensionality are relatively near one another in his diagram, indicating that they are fairly often grouped together in licensing particular forms of indefinite pronouns (like *any* in English), but far from always.

11. Kagan (2007) no longer claims that negation is intensional; her approach to unification of the two uses of genitive in Russian now rests on a more subtle and well-argued notion of "relative existential commitment".

12. The direct object in (7a) and (7b) is masculine animate, a class for which genitive and accusative have the same morphological realization. It is therefore impossible to determine whether (7b) is an instance of GEN NEG. It can be shown, however, that subjunctive relative clauses can occur on genitive, nominative and accusative NPs under the scope of negation, with a non-absolute preference for genitive.

If negation is not an intensional operator and yet it licenses subjunctive in examples like (6) and (7b), and we want a unified account of the distribution of subjunctive, there seem to be two options. Either there is some common feature shared by negation and intensional verbs such as non-veridicality that is responsible for licensing subjunctive, or negative sentences are more able than affirmative ones to accommodate the addition of a silent modal operator that in turn licenses subjunctive. We favor the second alternative, in part because not all negative sentences allow NPs with subjunctive relative clauses, and there seems to be a difference in potential modality between those that do and those that do not. Let us look briefly at some issues in the semantics of negation before continuing with this issue.

3.5 Negation and implicitly intensional quantification

Heim (1982) suggested, and Kratzer (1989) argued more thoroughly, that negation is best analyzed in some cases not as a simple one-place propositional operator, but as a covert negative quantifier, dividing any sentence it applies to into a restrictive part and a nuclear scope, much like the overtly quantificational *never, in no case.* Kratzer proposes two different kinds of negation. The first, 'generic negation', as in *Cats don't bark*, is not quantificational; it yields a proposition that will be true in all or none of the situations in a given world. The covertly quantificational negation, 'accidental negation', is a focus-sensitive operator which presupposes a domain and asserts that in this domain there is no instance of something or other. For this quantificational, 'accidental', negation, the domain must be large enough so that the proposition will be persistent (will not become false if one moves to a larger domain). Kratzer gives as a pair of relevantly contrasting sentences (8a–b).

(8) a. Paula isn't registered in PARIS.
b. PAULA isn't registered in Paris.

For sentence (8a) to be true, it must be evaluated in a situation large enough to include all places where Paula is registered; it then asserts that within such a situation, it is not true that Paula is registered in Paris. By contrast, for (8b) to be true, it must be evaluated in a situation that includes everyone registered in Paris, and it asserts that within such a situation, it is not true that Paula is registered in Paris. Informally, the first says that among the places where Paula is registered we will not find Paris, whereas the second says that among all the people registered in Paris we will not find Paula. The truth-conditions are not substantively different, but the implicit quantification over relevant situations is different.

As Kratzer notes, sentences with 'accidental negation' can become generic or modal by the addition of an overt or covert modal or generic operator, and in general there may be nothing in the overt form of a negative sentence to distinguish whether it is to be understood as 'accidental' or 'generic' negation.

Some sentences with 'accidental negation' are 'about' quite small situations, others 'about' much larger ones. Consider (9) and (10).

(9) This morning there wasn't a newspaper in the driveway.

(10) He hasn't met a woman who understands him.

Although both *a newspaper* in (9) and *a woman who understands him* in (10) are 'non-referential', the first is indirectly more specific than the second. The first concerns the absence of an expected newspaper on a particular occasion, while the second is intuitively much closer to sentences about seeking and finding: in all his encounters with women, he has not encountered any with the property of understanding him. Overtly each just denies the existence of a newspaper or 'a woman who understands him' in a certain situation; but the second situation is understood as a large one that invites us to think about many *possible* women who might have understood him. The negation together with the implicit quantification over women seems to invite implicit modality, hence quantification over possible women (or possible situations).

With such notions in mind, let us contrast sentence (7b) above, where a subjunctive relative clause sounds normal, with sentence (11a), where it does not;[13] sentence (11b), with indicative, is much preferred.

(11) a. *(?) *Kakoj-to gost' ne vidal devočki kotoraja by nosila*
some-TO guest NEG saw girl-GEN who-NOM SUBJUNC wear
krasnoe plat'e.
red dress

(#) 'Some guest didn't see a girl who wore (subjunctive) a red dress.'

b. *Kakoj-to gost' ne vidal devočki kotoraja nosila*
some-TO guest NEG saw girl-GEN who-NOM wear
krasnoe plat'e.
red dress

'Some guest didn't see a girl who was wearing a red dress.'

We hypothesize that the difference may be understood as follows. Although both (7b) and (11a) deny the existence of some kind of situation, they nevertheless differ in specificity/modality. In (11a), the phrase *kakoj-to gost'* 'some guest', both because of *kakoj-to* (specific unknown) and *gost'* 'guest', which is situation-relative, strongly

13. Sentences (11a–b) are from Igor Yanovich (p.c.), and we thank Igor Yanovich, Elena Paducheva, and Yakov Testelets for discussion of these and similar sentences.

implicates that we are talking about a narrowly constrained situation: a particular party, for instance. And the sentence says that within that situation, call it s_p, the party situation, there was no situation s' such that this guest saw in s' a girl who was wearing a red dress in s'.

Sentence (7b), on the other hand, isn't about a single occasion. It quantifies over all past situations, and in a sense over all the men I've ever seen, and says that in no situation have I ever seen a man who (thought/would think) otherwise.

Hence it seems that negation in (7b) is helping to license some modality, in comparison to both the affirmative (7a) and the single-episode negative (11a). It's not only the implicit quantificational "never" in (7b), quantifying over a wide range of sub-situations, but the sentence also seems to suggest a characterization of a 'kind' of man I've never seen, and to be considering not accidental properties (like the dress color in (11)), but dispositional properties: what he would think about some issue if it were presented to him. The affirmative (7a), like the negative (11a), seems to be understood as a being about single episode, although in principle it could be saying that at least one out of all the men I ever saw had that property. These and other facts are used in (Borschev et al. 2008) to argue that what unites GEN NEG and Genitive of Intensionality is a shift of the NP interpretation to property type, with a subtle related shift in the semantics of the verb, and that Negation is not itself intensional but can sometimes license the accommodation of a modal interpretation.

4. Partitivity and aspect in relation to negation and intensionality

What has been said so far about the relation between negation and intensionality has been based principally on the form and interpretation of NPs under the scope of negative or intensional operators. Previous work on various relationships between aspect and quantification (Bach 1986; Filip 1992, 1999; Krifka 1986, 1987, 1989; Mehlig 1983; Partee 1999) would suggest that we might find further relevant evidence in the behavior of aspect under negative or intensional operators.

Two recent lines of work suggest connections of negation and intensionality to aspect, particularly through similarities between imperfectives and partitives or genitives, including some that show up in particular under negation. One is the work of Kiparsky (1998) arguing for a close parallel in function between the Finnish partitive and the Russian imperfective, discussed in Section 4.1. The other, even more relevant, is recent work of Dmitry Levinson (Levinson 2005b, 2005a) on parallels in the history of Slavic GEN NEG and Slavic Imperfective in Negated Imperatives, discussed in Section 4.2. In later work in progress (Levinson 2006a, 2006b), Levinson explicitly connects irrealis contexts with negative polarity contexts.

4.1 Kiparsky (1998) on Finnish partitive and Russian imperfective

Kiparsky (1998: 272–3) focuses on the concept of boundedness and its role in the semantics of both partitives and imperfectives; he notes that the concept of boundedness (Russian *predel'nost'*) is standard in Slavic aspectology. He cites Dahl and Karlsson (Dahl 1985; Dahl & Karlsson 1976) as having emphasized the parallelism between the partitive vs. accusative case contrast in Finnish and the aspect contrast in Russian.

They point out that if either the verb is atelic (does not denote a completed event), or the object is an indefinite bare plural, then Russian in general requires imperfective aspect, and Finnish requires partitive case (see (12a)). Thus, in (12a) perfective aspect (in Russian) and accusative case (in Finnish) require both that the verb is telic, and that the object is plural and definite. The same sentences with imperfective aspect and partitive case, respectively, are three ways ambiguous (see (12b)):[14]

(12) a. *On napisa-l* (**PERF.**) *pis'm-a* (Russian)
He write-PST.M.3SG letter-PL.ACC

Hän kirjoitt-i kirjee-t (Finnish)
He/she write-PST.M.3SG letter-PL.***ACC***

'He wrote the letters' (… and left) (telic V, def. NP)

b. *On pisa-l* (**IMPERF.**) *pis'm-a* (Russian)
He write-PST.M.3SG letter-PL.ACC

Hän kirjoitt-i kirje-i-tä (Finnish)
He/she write-PST.M.3SG letter-PL-***PART***

(1) 'He wrote (some) letters' (… and left) (telic V, indef. NP)
(2) 'He was writing letters' (… when I came) (atelic V, indef. NP)
(3) 'He was writing the letters' (… when I came) (atelic V, def. NP)

(Kiparsky 1998: 272–3)

Then is the partitive in Finnish an instance of the same general phenomenon of "decreased referentiality" that we have been looking at above? Possibly, although the parallels are by no means exact.

Kiparsky shows a number of clear and interesting parallels, and argues for an interesting generalization about coercion (see below) which helps to explain some of the non-parallels. As he notes, Krifka had already analyzed the semantics of partitivity and of imperfectivity in a parallel fashion, unifying the meanings of

14. See Partee (2008) for discussion of some objections to the Russian data in (12b) and a potential resolution.

the partitive case and the progressive by analyzing both as predicate modifiers that mean 'part of'.

Krifka, like Kiparsky after him, was interested in showing how under certain circumstances, either an unbounded NP meaning or an unbounded verbal (aspectual) meaning could lead to similar or the same result (unboundedness) at the VP level.[15] For Krifka, the crucial properties that would allow either a partitive NP or an imperfective verb to have the same effect on VP interpretation were (i) that the verb be one with *divisive reference* (P(x) implies P(y) if y is part of x), and (ii) that the thematic relation connecting the verb with its object be the Incremental Theme relation, well-known from the work of Dowty (1989, 1991) and Krifka (1992). Kiparsky argues that Krifka's analysis might be right for Mordvinian, an earlier stage of Finnish, but not quite right for Finnish; the difference between his own analysis, crucially relying on his own definition of *boundedness*, and Krifka's analysis need not concern us here; they agree on most of the central examples. Both offer formalizations of the same leading idea, that 'unboundedness' in some sense is a property both of partitive meaning and imperfective meaning.

Kiparsky's paper makes it clear that languages can differ considerably in the relevant dimensions of unboundedness that they group together, and offers an explanation for some of the differences via an interesting constraint on coercion. "Both partitive and imperfective morphology can mark different semantic variants of unboundedness. Although these run parallel in Finnish and Russian in many cases … this is not always the case. Differences in how languages interpret unboundedness result from different *coercion* of bounded expressions into unbounded expressions and vice versa." (pp. 289–90). The principle that Kiparsky offers to account for these differences is that aspect can coerce shifts in the lexical meanings of verbs, while case can coerce shifts in the lexical meanings of nouns, and not vice versa.[16]

In quite a few works on the Russian Genitive of Negation, it is observed that a genitive-marked NP is in some sense 'less referential' than an accusative-marked NP, and it was noted above that both negative and intensional contexts are conducive to 'decreased referentiality' of NPs that occur within them. Unboundedness *per se*

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15. The role of Finnish partitive in determining the boundedness of the predicate is discussed by Kiparsky (1998) and Kratzer (2004). The puzzling incompatibility of Russian partitive and imperfective is addressed in Padučeva (1998).

16. These constraints may seem not to allow for the kind of 'semantic bleaching' of verbs that is found with subject GEN NEG in Russian existential sentences, as discussed in (Borschev & Partee 1998, 2002). But there is probably a principled distinction between this kind of coercion, if it can be called that, and the kind Kiparsky's constraints apply to. See the description of how such 'bleaching' works in the cited papers.

may not be a symptom of 'decreased referentiality', but partitivity, which is just one kind of 'unbounded' interpretation, does seem to be. Kiparsky notes that negated verbs in Finnish require partitive objects. But there is no immediate parallel between Finnish partitive and Russian imperfective in that respect; in normal declarative sentences, aspectual contrasts are maintained under negation,[17] and only a partial parallel between Finnish partitive and Russian genitive, since Russian genitive is normally optional rather than obligatory under negation. In the next subsection, we discuss some work by Dmitry Levinson that does uncover some relevant parallels between partitive-like interpretations of Russian imperfective and of Russian GEN NEG.

4.2 Levinson on imperfective in negated imperatives and Genitive of Negation

Whereas Kiparsky argues that partitive in Finnish and imperfect aspect in Russian are both used to mark a property of the whole VP, 'unboundedness', the Russian genitive is more closely bound up with the NP and its semantics. The Russian genitive (especially Object GEN NEG; also object partitive GEN) is not like the Finnish partitive: although the lexical semantics of the verb and aspect are relevant for 'licensing' the case, what is central is the NP-semantics. The NP should be "less referential" in some sense; and there may well be more than one way for an NP to be 'less referential' (much as there are several different kinds of 'imperfective' meaning), including being 'quantificational/partitive', being 'modalized/intensional' (not necessarily actual), being property-type or kind-type or 'abstract' in some sense. The relevance of verbal and aspectual semantics is to license such kinds of readings.

But Dmitry Levinson in recent papers and handouts (Levinson 2005b, 2005a, 2006a, 2006b) has indeed identified some interesting parallels between the Russian GEN NEG and Russian imperfective aspect, especially in the context of negation. He takes a historical perspective, concentrating on the similarity of possible motivation of historical development of GEN NEG and imperfective in negated imperatives.

The GEN NEG phenomenon has been described in earlier sections of this paper. The phenomenon of imperfective in negated imperatives, or "Imperfective of Negation", concerns the fact that in Russian and some other Slavic languages,

17. A positive, although not very strong, correlation between imperfective aspect and the choice of genitive as opposed to accusative under negation is discussed in Pereltsvaig (1999). There it is argued that decreased referentiality is supported by the use of the imperfective, not because of the unboundedness associated with a progressive interpretation of imperfective, but rather through habitual or generic interpretation of the imperfective form. This is not the use of imperfectives discussed by Kiparsky, Krifka, or Levinson.

only imperfective aspect can be used in negative imperatives that are 'about' intentional actions ('prohibitives').[18] Levinson proposes that these two phenomena can be given a parallel historical explanation, one that relies on the 'partitivity' of the initial semantics of both genitive case and imperfective aspect and on the semantic properties of the licensing negation.

In Levinson (2005a), Section 3.2, he states as a commonly accepted historical explanation for GEN NEG that it developed from partitive. Levinson supports the explanation offered by Kuryłowicz (1971): in the initial Stage 1, GEN NEG was really the partitive, and was used only with nouns that could also take partitive in the affirmative, mainly mass nouns and plurals. What motivated it was that under negation, the partitive gives a stronger negation than the accusative, since not drinking 'of water' entails not drinking 'the' water, and not vice versa. (The direction of entailment is opposite in affirmatives.) "Due to the tendency to intensify the negation, this usage becomes more common than the non-emphatic accusative." (p. 13) Then in Stage 2, "this usage of the genitive becomes associated with negation, and not the partitive meaning, and by *analogy* spreads to the nouns that are not used with partitive in positive sentences, that is, singular count nouns." (p. 13)

Levinson argues that the explanation offered in Bogusławski (1985) of the restriction to imperfective aspect in 'prohibitive' negated imperatives is parallel to Kuryłowicz's explanation for GEN NEG. Bogusławski's explanation applies most straightforwardly to accomplishment verbs, for which imperfective verbs denote activities that are not necessarily completed, while corresponding perfective verbs entail completion. As a result, in a simple affirmative sentence, the perfective will entail the imperfective, while under the negation, the direction of entailment is reversed.[19]

(13) a. *On postroil dom.* ⇒ *On stroil dom.*
he built-PF house he built-IMPF house
Roughly: 'He built the house' ⇒ 'He was building the house'

b. *On ne stroil dom.* ⇒ *On ne postroil dom.*
he NEG built-IMPF house he NEG built-PF house
Roughly: 'He wasn't building the house' ⇒ 'He didn't build the house'

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18. We thank Hana Filip for pointing out to us that while Russian patterns with Polish, Czech does not, contrary to Dokulil (1948) and Kučera (1985), cited by Levinson. Czech, similarly to Slovenian as described by Levinson, allows for perfectives to be used in negated imperatives to express prohibitions. Filip notes (p.c.) that the Czech version of the ten commandments contains five that are perfective negated imperatives, while the Polish and Russian versions contain negated imperative imperfectives with one or two exceptions, depending on the wording in particular versions.

19. Examples from Levinson (2005b), rough English translations our own.

The entailments in (13) provide the foundation of Bogusławski's explanation for preferring imperfective in negated imperatives: using the imperfective makes the command stronger. The negated imperfective command prohibits the activity and not just its completion. And here too the tendency to make negation emphatic leads to the preference for the stronger form, and frequent use then leads to grammaticization. The fact that the effect holds for intentional actions ('prohibitives') and not for unintentional ones ('preventatives', often achievements rather than accomplishments or activities and often construed as warnings, like 'Don't be late for the lecture') is explained by the absence of any 'activity' stage for unintentional actions, so that the imperfective cannot be used to 'strengthen' the negated achievement imperative.

Levinson summarizes: "As was shown above, both constructions can be explained as grammaticalization of an emphatic alternative due to overuse of emphatic negation. In negative imperatives imperfective is stronger than perfective. Negation with partitive direct object is stronger than with accusative. The explanation given by Bogusławski (1985) for negated imperatives and the first stage of Kuryłowicz's (1971) explanation for the genitive of negation have the same structure." (p. 16).

As Levinson notes, there are differences in the two constructions as well: GEN NEG in its later stage of development has become dissociated from Partitive and no longer has any necessary partitive meaning, while in 'Imperfective of Negation', Imperfective is still imperfective and is still understood as such – it only went through Stage 1.

In his later paper, Levinson (2005b) adds some discussion of French *de* and its use in partitives and in negation, showing that it is partly parallel to Russian GEN NEG in generalizing from an original source as a partitive construction to one that can be licensed by negation alone. In this paper he is also more explicit about connections to polarity sensitivity, citing Israel (1996) as giving a motivation for the development of NPIs that is the same as those given by Kuryłowicz (1971) for GEN NEG and Bogusławski (1985) for the "Imperfective of Negation": the statement with the emphatic NPI is stronger, i.e. entails the statement without it (as in the case of French *pas*, for instance.)

One of the interesting observations he makes here is that GEN NEG and *pas* are alike in losing their 'emphatic NEG' quality and becoming part of normal NEG marking, whereas imperfective in negated imperatives and most normal NPIs are alike in retaining the semantics that lets them express a 'strengthened' negation.

Genitive of Negation and negated imperfective imperatives are then both cases where the 'less referential' form (genitive, imperfective) makes a stronger statement than the unmarked form because of the downward-entailingness of the context. This is interestingly parallel to Kadmon and Landman's account (Kadmon &

Landman 1993) of the semantics of *any*: it induces widening, and is licensed in contexts in which the wider statement is the stronger statement. The imperfective verb form is the wider predicate in Kadmon and Landman's sense, i.e. things which do not count as building events in the denotation of *postroil* 'built-PF' do count as building events in the denotation of *stroil* 'built-IMPF'.[20] So under the scope of a negative, an imperfective is stronger than a perfective. Similarly, the semantic partitive (expressed historically by the genitive) is a wider predicate than the non-partitive, and thus negation leads to a stronger statement.

Given the above, we have a connection between GEN NEG, imperfective under the scope of negative imperatives and negative polarity items. The connection of these considerations to intensionality is less obvious, but we mention some speculative connections in the final section below. As Susan Rothstein notes (p.c.), the connection is perhaps not so much between imperfectivity or atelicity and 'diminished referentiality' as that there is a connection in each case to a contrast between more constrained and less constrained predicate denotations, which may lead to weaker or stronger statements under negation; diminished referentiality may be a side effect of a less constrained predicate.

5. Conclusions and further research

Negation and intensionality are certainly not completely alike, nor are partitivity and imperfectivity, but we have made some steps toward identifying generalizations that need to be accounted for, and second, toward finding formal properties through which we can capture the similarities and differences (family resemblances) among the phenomena we observe. As Haspelmath (1997) has shown, studying semantic typology can help us map out the semantic space within which languages distinguish different regions, lexically, morphologically, or syntactically. In the phenomena we've looked at here, quite informally, we've seen how the domains that include negation and the intensional verbs have some commonalities that are not initially obvious. English does not put those two kinds of phenomena together in any formal way; Russian and some other languages sometimes do.

What ARE the similarities and differences in this case? Giannakidou (1998) has argued that the main similarity can be captured as non-veridicality, but not all intensional operators are non-veridical (e.g. *know* is not.) Levinson (2006a) argues, using cross-linguistic data, for the thesis that Irrealis is a negative polarity

20. Thanks to Susan Rothstein for help in articulating these ideas, and for pointing out the similarity of Levinson's arguments to Kadmon and Landman's work.

item, Realis a positive polarity item. But his arguments really just point to parallels between Irrealis marking and NPIs, and hence similarities between Irrealis-creating operators and Negation and other NPI-licensing operators. He does not give any explicit reason for calling Irrealis an NPI rather than the reverse; we believe neither property subsumes the other.

There are also differences between Negation and intensional operators. One important difference is extensionality as determined by the standard Substitution test: Intensional verbs fail it, negation passes it. A second partial difference is in monotonicity properties. Negation is 'downward-entailing'; whereas intensional verbs may be quasi-upward-entailing (Ladusaw 1996), quasi-downward-entailing, or neither.

There is obviously much more work to be done to further dissect the relevant phenomena and the relevant properties so as to try to end up with an explanatory account of the distribution of forms and meanings in this area. One hypothesis that appears worth further exploration is the following: Non-veridicality might naturally license decreased existential commitment. Intensionality might rather license decreased specificity. This suggests studying three kinds of semantic properties together: (i) semantic properties of intensional, negative, and other operators; (ii) semantic properties of the sorts of NPs that have restricted occurrence (*any student, the slightest sound, any book whatever,* Russian genitive NPs, and others), and of imperfective aspect and restrictions on its occurrence; and (iii) possible shifts in semantic properties of 'ordinary' NPs when occurring under various operators (such as a shift from an e-type interpretation to a property-type interpretation). The connection to Kadmon and Landman's account of licensed 'widening' leading to 'strengthening' may be one promising avenue for viewing these varied phenomena as belonging to a common family.

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The Estonian partitive evidential

Some notes on the semantic parallels between aspect and evidential categories*

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This article shows that the Estonian partitive evidential marks predicates in sentences that express incomplete evidence. Partitive occurs in the categories of aspect, epistemic modality, and evidentiality, marking objects and present participles. Despite the difference in syntax, the semantics of these categories is based on parallel relationships. More specifically, the aspectual partitive marks objects in sentences describing incomplete events, and the partitive evidential appears in sentences that encode incomplete evidence compared to the expectation of complete evidence.

1. Introduction

The Estonian partitive evidential is a morphological form that encodes incomplete evidence for an event or proposition. The article approaches the phenomena from the viewpoint of natural categories developed from partitive case marking in Estonian and links them with cross-linguistically pre-established categories such as evidentiality, epistemic modality, and aspect.

Evidentiality is a grammatical category that encodes specifications about the speaker's source of information. In literature on evidentiality, there are

*I gratefully acknowledge the grant JD 64 from the Estonian Science Foundation, and the grant OTKA PD 73826 from the Hungarian Scientific Research Fund for finishing up this article. I am indebted to the TAMTAM 2006 workshop organizers and participants, for the invitation and for many fruitful discussions, and especially to Helen de Hoop, for encouraging me to concentrate on evidentiality. I am grateful to the colleagues from the Institute for the Estonian Language and the anonymous reviewers, whose comments have greatly clarified the issues in the article. Special thanks to Alexandra Aikhenvald for discussions on the terminology and content of the phenomenon. Mistakes are mine.

two main approaches to evidential meaning diverging according to what these specifications are. On the one hand, there are approaches that argue for clearly separated epistemic modal and evidential categories (Aikhenvald 2004; van der Auwera & Plungian 1998): the former specifying the belief in the truth of the proposition and the latter the source for it. The partitive evidential marking combines evidential and epistemic modality in terms of these approaches. On the other hand, the two categories are sometimes regarded as overlapping or, more precisely, evidentiality is subsumed under epistemic modality (Palmer 1986; Kiefer 2000; Boye 2006). In terms of such approaches, the partitive evidential encodes evidential meaning as a special type of epistemic meaning. This article shows that, in some occurrences, the partitive evidential encodes the source of the speaker's knowledge about events, but also meanings such as incompleteness of evidence and the degree of strength of evidence. The Estonian partitive evidential has developed in an environment of contact with European languages, which typically combine epistemic and evidential meanings.

Teasing apart evidentiality and epistemic modality and accounting for their overlap has remained a major challenge in the literature on evidentiality. In the analysis of de Haan (2005), evidentiality asserts evidence while epistemic modality evaluates evidence.[1] While some languages encode epistemic and evidential meanings separately, this is not the case with the Estonian partitive evidential, which combines the two categories in one morpheme. However, the separation of the data along the two categories offers insights into the fine details of the borderline areas of these categories. For instance, Faller (2002) discusses the conjectural morpheme *–chá* in Cuzco Quechua, which combines an inferential and epistemic meaning and suggests an area of overlap between the epistemic and evidential categories. Estonian, however, encodes the indirect evidential and epistemic meanings in an identical morpheme.

In order to understand the fine details of the evidential and epistemic semantics of the partitive evidential, another category is indispensable. This category is aspect, the category that deals with the properties of events. It is crucial for the analysis since the partitive evidential has its origin as an aspectual marker and recognizably encodes meaning elements similar to those that are observed in the Estonian aspectual category. This article argues for the aspect-related understanding of the partitive evidential along the lines suggested in Tamm (2004a: 97fn.) where

1. De Haan (2005) also argues that evidentiality is a deictic and not modal category. This analysis seems plausible, since there are previous studies pointing at an occasional relationship between the aspectual object case alternation and definiteness-related issues (Hiietam 2003; Rajandi & Metslang 1979; Tamm 2008b).

it is observed that the semantics of the aspectual partitive resembles that of the evidential partitive.[2] The partitive evidential, as in the form 'kirjutavat' in example (1), has originally developed from the aspectual partitive object marking, examples of which are found in the form 'raamatut' in examples (1) and (2). In Modern Estonian, the indirect evidential sentence with the partitive evidential – the partitive-marked personal present participle in (1) – contrasts with the indicative sentences without any evidential marker in (2) and (3). The aspectually unbounded sentences with the partitive object, as in (1) and (2), contrast with the aspectually bounded sentence with the total object case marking, as in (3).[3]

(1) *Mari* *kirjuta-**va**-**t*** *raamatu-**t**.*
M[NOM] write-PERS.PRS.PTCP.PART book-PART
'Reportedly/allegedly, Mary is writing a book.'

(2) *Mari* *kirjutas* *raamatu-**t**.*
M[NOM] write-3S.PST book-PART
'Mary was writing a book.'

(3) *Mari* *kirjutas* *raamatu.*
M[NOM] write-3S.PST book.TOT
'Mary wrote a book.'

Modern Estonian displays clear semantic parallels between the aspectual and evidential partitive. This article argues for a parallel in terms of a comparison between the expectation that the speaker holds about the event and the actual event. An expectation is understood as a belief about or a mental picture of a state of affairs. 'Expectation' is a notion that is part of the explanation of other TAM categories as well, such as mirativity (Dahl 2008), or attitudes (Katz 2005). Expectations are epistemic meanings that belong to the presuppositions associated with a proposition. Comparing the event (or the evidence for the event) to

2. Tamm (2004c) discusses scalarity based verb classes compared to scalarity in evidentiality, as defined in terms of Palmer (1986). Tamm (forthcoming) discusses the epistemic modal meanings in more detail.

3. The glosses follow the Leipzig glossing rules, available at <http://www.eva.mpg.de/lingua/files/morpheme.html>. Additional abbreviations: ADE adessive, ALL allative, COND conditional, DA_INF *d*-stem non-finite form (the '*da*-infinitive'), ELA elative, ILL illative, IMPERS impersonal, INDIR indirect, INE inessive, MA_INF *m*-stem illative non-finite form, the supine (the '*ma*-infinitive'), MAS_INF *m*-stem inessive non-finite form (the '*mas*-infinitive'), MAST_INF – *m*-stem elative non-finite form (the '*mast*-infinitive'), NUD_PTCP active/personal past participle, PART_EVID – partitive evidential, PART partitive, PERS personal, PRT particle, TOT total (semantic accusative), TRANSL translative (transformative), TUD_PTCP passive/impersonal past participle.

the expectation, the forms without partitive marking encode a match between the expectation and the event (or the evidence for the event). In the following sections, I refer to this match with the expectations with the terms 'complete events' and 'complete evidence'. The forms with partitive marking encode that the event or the evidence for the event falls short of the expectation; the strength of the evidence provided by the source is not strong enough in case of a mismatch between the available evidence and the expected evidence. In the following sections, I refer to the mismatch with the expectations with the terms 'incomplete events' and 'incomplete evidence'. With respect to evidentiality and epistemic modality, the data in (2) and (1) contrast in type of evidence, representing complete evidence and incomplete evidence, respectively. In (2), the speaker presents the evidence for Mary writing a book as corresponding to the expectation, while in (1), which is a report, the strength of evidence does not live up to the expectation. With respect to aspect, sentences with an object that is non-partitive, as in (3), encode semantically complete events. Sentences with partitive object case marking encode incomplete events, as in (1) and (2).

The parallel between evidential, epistemic modal and aspectual domains is not surprising if the role of case is considered in Estonian. Being part of the Uralic language family, Estonian (or Baltic-Finnic, in general) has a rich morphological case system of 14 cases, most of which have distinct semantics. Estonian also has several non-finite forms. The coexistence of these two phenomena is not accidental: non-finite forms frequently originate from case-marked nominalizations, which are originally complements but develop further into subordinate clauses. The subordinate clause type may have been reinterpreted as a main clause, while the case marker was reinterpreted as a mood marker.[4] As a result, the meanings associated with the case of a verbal argument transferred to a more abstract domain. Parallels between categories that arise due to the semantic import of the Estonian partitive cross-categorial case marker, provide support for more semantic approaches to the structural (grammatical) case, as can be found in de Hoop (1996), Butt and King (2005), Butt (2006), Nordlinger (1998), Nordlinger and Sadler (2004), and Kiparsky (1998, 2001, 2005), as opposed to the approach to the Finnish partitive as the 'default' case (Kratzer 2004 and references therein). The Estonian data will show that this line of research is insightful, since in Estonian, aspect, epistemic modality, and indirect evidentiality are related in an intricate way via the partitive case.

4. Case may attach to predicates without any non-finiteness as well, creating similar effects, as in languages such as Kala Lagau Ya (Blake 2001: 180).

Section 2 gives an overview of aspect and the partitive case in Estonian. Section 3 introduces the partitive form and Section 4 the hypotheses about the evidential-epistemic partitive, followed by the subtypes of the partitive evidential. Section 5 is on independent partitive evidential uses, where the meaning of indirect evidentiality combines with incomplete evidence. Section 6 is on the so-called 'quotative', that is, subordinate clauses with *verba dicendi*. Section 7 deals with mental epistemic verbs, Section 8 with visual evidence and other types of sensory evidence. Section 9 explores the phenomenon of partial access to the relevant course of events. The factors reducing the strength of evidence and the partitive evidential occurring with direct evidence are studied in Section 10, followed by a summary of the data analysis and discussion (Section 11) and a final conclusion.

2. Aspect and the partitive case

The partitive case has developed on the basis of a separative case, originally meaning 'part-of'. Larjavaara (1991) details the development of the aspectual partitive object on the basis of part-whole relationships and language contacts in Baltic-Finnic. The case marking of the object in examples (2) and (3) may be understood as reflecting an opposition in terms of part-whole relationships that are isomorphically mapped to the progress of events (Krifka 1992). On the one hand, once the whole book is ready, the total event of 'writing the book' is over, which is grammatically marked with the total object case.[5] On the other hand, when only part of the book is written, one is in the middle of the event of book-writing, which is grammatically encoded by the partitive object case. However, in Modern Estonian, the partitive encodes the properties of the event without any direct reference to the physical parts of the theme argument. In Modern Estonian, the physical parts of a book, such as pages or characters up to the final period at the end of the last sentence, cannot be understood as the created parts that constitute the book at the end of the book-writing event. An idea of the process of writing the book is rather a matter of matching the expectations about the completion of the immaterial properties of the book; the parts that constitute the progress along the writing event cannot be identified as the physical parts of the final result that serve as the basis for the event-object isomorphism. Solutions to this kind of mediated partitivity involve degrees and reference to scales, as in Piñón (2008), Hay et al. (1999), Kennedy and McNally (2005), or Kiparsky (2005).

5. The total object case can also be understood as a semantically conditioned accusative. See Tamm (2004b) for details of the terminology for the Estonian object cases.

The Modern Estonian partitive object case does not encode the semantics of part-whole relationships, it is considered to be related to aspect in most sources.[6] Metslang (2001) connects partitive objects with imperfectivity. Atelicity and non-boundedness are also found to be suitable terms to cover the semantic content of the partitive. Tamm (2007b) shows that the Estonian object case alternation corresponds closely to the alternations of perfectivity/imperfectivity and telicity/atelicity. However, the correspondence is a loose fit and, therefore, maximal boundedness and non-maximal boundedness are considered as the preferred alternative terms for describing the poles of the opposition of the case alternation. The book-writing event is progressing via successively higher degrees of completion towards the final result that corresponds to the expectations about the book and a completed book-writing event. Tamm (2004a) sketches a scalarity based verb classification, where the range of possible cases for the objects is partly predictable from the scalar properties of the verbs; the case specifies the details about the endpoint or the boundary of the event (Tamm 2004b, 2007a, 2007b).

This approach builds on those sources in considering the partitive object case to reflect the absence of reaching the highest degree of event realization, the maximal boundary of the event. In sentence (3), containing the total object case, the event has an expected endpoint that has been reached, a book that has been written according to the expectation of the writer. Therefore, the realization of the book-writing event is complete; the degree of event realization as presented in (3) defines the maximal point on the scale of event realization. Compared to the same expectation, the partitive object encodes that the reality about event realization falls short. On the scale of event realization, the event has not reached the endpoint, the maximal point. The event related to the book does not live up to the expectation, and the object is encoded as partitive. In sum, events that are realized

6. Some examples of aspectual approaches that deal with either the Finnish or Estonian partitive are Metslang (1994, 2001), Erelt et al. (1993), Kont (1963), Rätsep (1978), Ackerman and Moore (1999, 2001), Heinämäki (1984), Verkuyl (1993), Kiparsky (1998), Tenny (1994), Vainikka and Maling (1996), Tauli (1968, 1983), Klaas (1996, 1999), Tamm (2003a, 2003b, 2004b). However, several NP-related accounts have been proposed by Hiietam (2003), Rajandi and Metslang (1979), cf. also de Hoop (1996), van Hout (2000) and Belletti (1988) on Finnish. Several previous works have discussed additional aspects associated with the Estonian regular object case alternation. The changing of grammatical functions of objects and subjects are dealt with in, for instance, Erelt et al. (1993) and Kont (1963); the partitive of negation is detailed in Erelt et al. (1993), Kont (1963), and Larsson (1983), some relationships between partitive and quantification are found in Larjavaara (1991: 372) for Finnic in general, and in Erelt et al. (1993); definiteness and related terms are the focus in Hiietam (2003), which touches upon the partitive as well, in Rajandi and Metslang (1979) and in Lees (2005).

completely do not encode partitive objects and events that are incomplete do have partitive objects, as summarized in Table 1.

Table 1. Event properties and object case

complete event	no partitive
incomplete event	partitive

Neither the partitive that is referred to as aspectual nor the partitive that is referred to as evidential are strictly speaking only markers encoding aspectual, evidential, or epistemic modal semantics. The central meanings of these morphemes do correspond to the semantics of these cross-linguistic comparative categories quite neatly. However, crucially, they retain the semantics inherited from their past as a marker of part-whole relationships. The semantics imposed by the partitive form contributes additional meanings that fall out of the range of the central meanings of aspect and evidentiality. More specifically, a negation test indicates, among others, the existence of a presuppositional expectation, since the expectation of the complete event is retained after negation (4) (the main accent should be on the predicate). Inherently atelic verbs such as *nägema* 'see' or *kuulma* 'hear' lack this effect.

(4) *Mari ei kirjutanud raamatu**t**.*
M[NOM] NEG write-NUD_PTCP book-PART
'Mary did not write the book.'

The grammaticalized opposition between complete and incomplete renders the semantics of the aspectual and evidential (epistemic modality) categories similar in Estonian. It must be pointed out that Estonian demonstrates transparent relationships between evidentiality (epistemic modality) and aspect from a different perspective than generally discussed. Previous work on modeling the aspect-evidentiality relationship has concentrated on the perfect. This paper brings out the relationship of indirect evidentiality, epistemic modality and the imperfective or atelicity. For instance, there are parallel structures in the TAM semantics as demonstrated in the analysis in Izvorski (1997), where the present perfect is given an analysis in terms of epistemic modality. Parallel structures exist also in other Finno-Ugric languages; Nikolaeva (1999) writes about Northern Ostyak but reports of evidentials in Vogul, Zyryen, Cheremis, Votyak, Nenets and also Yukaghir. Again, it is not the link with atelicity or imperfectivity that has been detailed for these languages. Previous sources typically capture the semantic parallel between the perfect and its similarities to indirect evidentiality.

3. The evidential partitive form

The fact that previous sources typically capture the link between the perfect and evidentiality and the scarcity of works on the link between atelicity or imperfectivity and evidentiality is not surprising if we consider the peculiarities of Estonian that other languages lack. More specifically, I mean the rich case marking of Finnic and the well-developed aspectual partitive. Finnish lacks the evidential partitive development. The Modern Estonian partitive evidential is originally a partitive case-marked participle form.[7]

(5) *Mari* *tule-**va-t*** / *too-**da-va-t*** *koju.*
M[NOM] come-PERS.PRS.PTCP.PART bring-IMPERS.PRS.PTCP.PART home.ILL
'Reportedly/allegedly, Mary will come home / Mary will be taken home.'

The development of the relationships between the aspectual and evidential categories and case marking in Estonian has been addressed in Tamm (2008a). In Modern Estonian, partitive is the case of the shared argument of the sentence with the verb 'hear' and the partitive evidential predicate (*kägu* 'cuckoo.PART' in (6)). Partitive is also the case of the argument of the verb 'hear' in Modern Estonian (*kägu* 'cuckoo.PART' in (7)). These arguments are marked with the partititve, since the sentence with the verb *kuulma* 'hear' is atelic. There is no expectation with respect

7. The corresponding Estonian grammar terms are the '*v*-kesksõna' (for partitive-marked personal present participle) and the '*tav*-kesksõna' (for partitive-marked impersonal present participle); both terms are related to the content of '*kaudne kõneviis*' *modus relativus* or *obliquus*, indirect speech, indirectal, or *vat*-infinitive in grammars. Saareste (1940: 352 in Kask 1985: 5) dates the category *kaudne kõneviis* back to 16th–18th century; Kask (1985: 6) writes that the triumph of the *vat*-form was in the 20ies of the 20th century. An overview of the variation of forms of the *kaudne kõneviis* can be found in Kask (1985: 6–7). Ikola (1953: 41) in Kask (1985: 7) writes about the participial or *accusativus (or nominativus) cum infinitive* origins. Historical sources are unanimous about the diachronic partitive marking in the morpheme (e.g., Laanest 1975). The partitive evidential, the *vat*-form, has been related to the indirect mode of communication and evidentiality (Rätsep 1971; Aikhenvald 2004; Metslang & Pajusalu 2002; Erelt, Metslang & Pajusalu 2006; Tamm 2004a; Tamm 2008c, Tamm forthcoming; Sepper 2006; Klaas 1997, 2002; Erelt 1984, 2001, 2002a, 2002b). See Kehayov (2008), Sepper (2006), Erelt et al. (1997), Rätsep (1971), Mihkla et al. (1974) and Kask (1985) for more details about the terminology that has been used in the Estonian previous sources for the form (these sources are in Estonian) and Erelt, Metslang and Pajusalu (2006) or Tamm (2008a) for the selected previous accounts (in English). Note that the glosses reflect the historical origin until Example (5) but not further.

to the maximal realization associated with an event of hearing, and, therefore, the total case is impossible and partitive is encoded.[8]

(6) *Mari* *kuulis* *kägu* *kukku-va-**t**.*
M[NOM] hear-3S.PST cuckoo.PART cuckoo-PART_EVID
'Mari heard a/the cuckoo cuckoo.'

(7) *Mari* *kuulis* *kägu.*
M[NOM] hear-3S.PST cuckoo.PART
'Mari heard a/the cuckoo.'

Sentence (6) has the partitive evidential form *kukkuvat* 'cuckoo'. Diachronically, this form modified the aspectually partitive-marked object *kägu* 'cuckoo.PART', which triggered case agreement on its modifier *kukkuvat* 'cuckooing.PART'. The sentence could be paraphrased as 'Mary heard a cuckooing cuckoo'. At a later stage, the noun remained to be analyzed as the object of the perception verb ('Mary heard the *cuckoo*'), but in addition, it became analyzed as the subject of the non-finite form ('the *cuckoo* cuckooing'). The stage of being analyzed as the subject of a non-finite predicate marks the beginning of the independent development of the partitive marked participle. Competing with other non-finite forms (Habicht 2001), the participle established itself as a kind of *modus obliquus* (subjunctive, conjunctive) marker. However, the embedded form appears only with a restricted set of matrix verbs. Aikhenvald (2004: 282–3), following Campbell (1991: 287), discusses the further development of the independent predicate marking evidential form, which she refers to as 'the Estonian reported evidential'. She also summarizes the relevant discussions in several Estonian sources. Two existing complementation patterns, as in (8) and (9), were merged in one, as in (10), followed by a process where the matrix verb and the complementizer became optional as in (11) (example of Campbell 1991) or (12) (example of Aikhenvald 2004, all original glosses are retained).

(8) *sai* *kuulda,* *et* *seal* *üks* *mees* *elab*
got hear-INF that there one.NOM man.NOM live-3PRES.INDICATIVE
'She came to hear / she heard that a man lives there.'

(9) *sai* *kuulda* *seal* *ühe* *mehe* *elavat*
got hear-INF there one.GEN man.GEN live-PRES.PARTCP
'He came to hear / he heard of a man's living there.'

8. See Tamm (2004a, 2007a, b) for more details.

(10) *sai kuulda, (et) seal üks mees elavat*
got hear-INF that there one.NOM man.NOM live-MODUS.OBLIQUUS
'He came to hear / he heard that (they say) a man lives there.'

(11) *ta tegevat tööd*
he.NOM do-PRES.INDIR work-PARTV
'They say he is working.' Campbell (1991: 287)

(12) *seal üks mees elavat*
there one.NOM man.NOM PREST.PART.PARTVE.SG = REP.EVID
'a man lives there (it is said).' Aikhenvald (2004: 283)

Understanding the evidential as a form that has evolved from expressing part-whole meanings to expressing scalar meanings helps solve an interesting typological puzzle posed by Estonian and Bulgarian as described by Kehayov (2008). Despite the form-function parallellism – a participial form functions as an evidential in both Bulgarian and Estonian – the semantic parallels between the two languages are missing. Bulgarian is a "one form-diverging semantics" type of language, Estonian is a "clear semantics-many forms" type. This article provides an explanation for Kehayov's puzzle. Namely, the grammaticalization of Estonian has followed a different path altogether, via forms that carried different semantics. In sum, the evidential partitive started off as an instance of aspectual partitive case marking and gradually crystallized as an evidential and an epistemic modal in the Estonian system.

4. Three hypotheses about the Modern Estonian partitive evidential

The peculiar path of grammaticalization of the Estonian partitive evidential offers insight into the relationships between evidentiality, aspect, and epistemic modality, since the different stages of the development are still present in Modern Estonian. The following sections concentrate on the occurrences that represent some of these stages and demonstrate how the evidential and epistemic modal domains share semantic structure with aspect. This subsection provides an introduction to the topics that are presented in more detail in the following sections.

In terms of Aikhenvald (2004), most of the examples of the partitive evidential discussed in this article can be categorized as epistemic modality. Following Aikhenvald (2004), there are two types of evidential marking: 'indirectivity' marking ("type I") and 'evidential' marking ("type II"). The first type indicates whether evidence exists for a given statement. The second type specifies the kind of evidence (visual, inferential, reportative, etc). Aikhenvald (2004) classifies Estonian as a two-term, type I language, which contrasts 'reported evidence' with everything else.

Compared to the Estonian data discussed in Aikhenvald (2004), the following sections address more instances of the partitive evidential (epistemic) form in embedded environments in combination with several verb classes, such as verbs of saying or mental epistemic verbs. On the basis of the data discussed in this article, I will show that in embedded environments it is irrelevant whether the information resulting from hearsay or nonvisual perception is encoded with the partitive evidential. In this sense, what I refer to as the partitive evidential comprises a wider range of meanings than an A3 language as in Aikhenvald (2004: 33), where indirect and all other evidence are contrasted. However, 'inference' is set apart as a separate category and is excluded from the set of partitive evidential meanings. In addition, my approach discusses a wider range of speaker-event relationships. In this respect, my goals are close to those of Garrett (2001), Faller (2002), or de Haan (2005).

The proposal here is thus to analyze a wider array of occurrences and see which analysis fares best in each occurrence of the partitive evidential. Some informally worded hypotheses are a good starting point for the investigation of the partitive marked present participle in environments where it is not partitive marked due to agreement with a nominal head.

1. The indirect hypothesis: the occurrences of partitive marked present participle have evidential indirect semantics. The prototypical examples of the category comprise instances that are reportative evidentials, which indicate that the information was reported to the speaker by another person, hearsay evidentials, which indicate reported information that may or may not be accurate, and quotative evidentials, which indicate that the information is accurate and not open to interpretation. The category is tested with continuations that refer to the hearsay or indirect nature of the proposition such as *Nagu mulle räägiti/kuuldavasti* 'as I heard/was told'.
2. The epistemic modality hypothesis: the occurrences of the partitive marked present participle have epistemic modal semantics. This is a category that is concerned with the marking of the speaker's degree of confidence, certainty or belief in the proposition, which I test with variants of sentence continuations that are sensitive to the belief in evidence, such as *mida ma ei tea kindlalt* 'which I do not know for sure'.
3. The partitive hypothesis: the occurrences of the partitive marked present participle have the scalar semantics that is characteristic of the aspectual domain in Estonian and remotely related to part-whole relationships. This meaning bears closest resemblance to epistemic modality but is a category defined language-internally on the basis of the developments of the Estonian partitive and its semantics. According to the partitive hypothesis, there is a

semantic category that is sensitive to the degree of completeness. In case of evidentiality, the morphological encoding is sensitive to the degree of strength of evidence for the event. In case of aspect, the morphological encoding is sensitive to the degree of event realization. In other words, partitive encodes that something is less than what was expected. I test this meaning element with continuations containing completion adjectives and scale-sensitive tests such as *mille jaoks mul ei ole täielikku tõendust* 'for which I have not got complete evidence' and tests that are sensitive to the degree of belief.

In addition, I occasionally use other types of tests to check the compatibility with different sources of perception and in order to clarify the type of meaning relations in the example sentences. I expect all hypotheses to be correct for some cases, giving a more complete picture about the data. Importantly, I wish to introduce the concept of epistemic modality into an analysis of a wider range of the occurrences of the partitive evidential and show that the semantics of the category bears similarities to the Estonian aspectual semantics.

5. Independent partitive evidential uses: Reportative with incomplete evidence

The partitive evidential appears in embedded environments and has an independent use, which comes closest to Aikhenvald's definition of evidentiality. This subsection confirms Aikhenvald's classification of the morpheme as a reportative. However, it provides evidence that the evidential is not a pure reportative, since the report necessarily combines with the meaning of incomplete evidence (or the speaker's decision to present the evidence as such). An instance of independent use of the partitive evidential is presented in (13), which forms a minimal pair with the unmarked indicative form in (14). The modification of the unmarked (indicative) sentence by 'as I was told/they say/ (inferential) probably' in (14) shows that while the partitive evidential has its distinct semantics, it is not the case that the elements of this particular kind of semantics necessarily trigger the use of the morpheme. The indicative form may be underspecified for the semantics under investigation; the semantic content can be expressed by lexical as well as morpho-syntactic means. In addition, the impossibility of an inferential adverb *nähtavasti/ilmselt* 'probably ('as can be inferred on the basis of what we see')' in (13) as opposed to (14) proves that the partitive evidential is not a vague indirectivity marker and it certainly is not an inferential marker.[9]

9. It is the indicative Example (14) and not (13) that is used in inferential contexts as hearing a doorbell, in the knowledge of the fact that Mary should be arriving.

(13) *(Nagu mulle räägiti / kuuldavasti / #nähtavasti)*
As I.ADE tell-PAST-IMPERS as heard probably-inferential
Mari tulevat koju.
M.[NOM] come-PART_EVID home
'Allegedly, Mary is coming home.'

(14) *(Nagu mulle räägiti / kuuldavasti / nähtavasti)*
As I.ADE tell-PAST-IMPERS as heard probably-inferential
Mari tuli koju.
M.[NOM] come-3.S.PST home
'As I was told/they say/probably, Mary came home.'

The evidence available to the Speaker does not correspond to the expectation about the required evidence for the event in a sentence with the partitive evidential used independently. This can be an 'entailment' in (13); the combination of sentences is anomalous if extended by a phrase that conveys strong evidence for the event, as in example (15) with past reference and the extension 'which I've seen myself and I know for sure.' The semantics of report can also be an entailment, as witnessed by the non-cancelable nature of mediation by the phrase 'which I have not learned from anyone else' in (16).

(15) *# Mari olevat tulnud, mida nägin ise pealt*
M.[NOM] be-PART_EVID come-NUD_PTCP, which I've seen myself
ja tean kindlalt.
and I know for sure.
('Allegedly, Mary has come, which I've seen myself and I know for sure.')

(16) *# Mari olevat tulnud, mida ma pole kelleltki*
M.[NOM] be- PART_EVID come-NUD_PTCP, which I've not learned
teada saanud.
from anyone else
('Allegedly, Mary has come, which I've not learned from anyone else.')

In addition, the indicative example (14) and not the partitive evidential one (13) can be used for reporting information from other sources, such as letters, signs, newspapers, books, radio, TV, or other speakers. It is not a quote, but rather closer to hearsay. Faller (2006: 4) describes a situation of improvised testing of the reportative in Cuzco Quechua, where the reported evidential is used by a mediator to render her question to a hard-hearing mother-in-law in a louder voice. This situation does not lead to the use of the Estonian partitive evidential; instead, the indicative is used.

On the other hand, testing maximal evidence splits markedly in indicative sentences, showing that strictly evidential meaning is cancelable (17) while the

judgment about full evidence is not (18). The lack of report and vision are cancelable as shown in (17) and (19); therefore, they are implicatures in the corresponding indicative sentences.

(17) *Mari* *tuli* *koju, mida ma ise pealt ei näinud.*
M.[NOM] come-3.PAST.SG home which I have not seen myself
'Mary came home, which I have not seen myself.'

(18) # *Mari* *tuli* *koju, mida ma ei tea*
M.[NOM] come-3.PAST.SG home which I do not know for
kindlalt/mille jaoks mul ei ole täielikku tõendust.
sure/for which I have not got complete evidence.
'Mary came home, which I do not know for sure/for which I have not got complete evidence.'

(19) *Mari* *tuli* *koju, mida ma pole kelleltki teada saanud.*
M.[NOM] come-3.PAST.SG home, which I've not learned from anyone else
'Mary is coming home, which I've not learned from anyone else.'

In the indicative sentence, the data in (17)–(19) show that the evidence available to the speaker corresponds to the expectation about the evidence, and the source of the message does not have to be another speaker. If a partitive evidential sentence is negated, the sentence containing the independent use of the partitive evidential retains the presupposition of another speaker (allegedly...) as the source of the message about the event in (20).

(20) *Mari* *ei* *olevat* *tulnud* *koju.*
M[NOM] NEG be-PART_EVID come-NUD_PTCP home
'Allegedly, Mary is not coming home.'

Applying a test in Faller (2002: 100), the propositional content can be questioned with adverbs such as 'really' (21). The test shows that the propositional content pertains to the epistemic modal part of the meaning and not the reportative part. Faller (2002: 110) studies the claim that epistemic modals are not propositional-level operators, and applies a test that she refers to as 'challengability test'. If the meaning of the morpheme can be questioned, doubted, rejected or (dis)agreed with, then it contributes to the truth conditions of the proposition expressed, otherwise, it does not. Example (21), applied to (13), shows that the test can be understood as yielding either a pass or a failure; what can be questioned is the epistemic part of the meaning but not the indirect part.

(21) *Kas* *tõesti* *(sa ei tea seda /* *#kas* *tõesti keegi seda sulle ei öelnud)?*
Q_PTCL really you do not know / Q_PTCL really nobody told you
'Really?' (Understood as: you really do not know? And not: really, nobody told you?)

Although many issues around this test are still unclear, it brings out a difference in the interpretation of the partitive evidential. According to the test, the partitive evidential contributes to the truth conditions of the proposition expressed as an epistemic modal and does not contribute to the truth conditions as an indirect evidential.

These data confirm the three hypotheses worded in the previous subsection. The form in main clauses encodes pure evidentiality, epistemic modality and, being sensitive to completion adverbs or adjectives, it confirms the partitivity hypothesis with respect to aspect. The independent use of the partitive evidential is an epistemic modality-conditioned reportative evidential, which encodes the lack of complete evidence.

6. The quotative: *Verba dicendi*

The prototypical examples of the partitive evidential that are discussed in grammars and several previous sources encode indirect evidentiality and are referred to as the the quotative category, illustrated in (22). Combinations of an embedded partitive evidential verb and matrix *verba dicendi* are the basis for the meaning extension to indirect evidentiality in independent, non-embedded contexts as in sentence (1).[10] The tests in (23) and (24) aim at detecting the meaning elements that are sensitive to evidence in example (22) that contains the partitive evidential.

(22) *Mari ütles, et ta olevat koju tulnud.*
M[NOM] say-3S.PST that s/he be-PART_EVID home.ILL come-NUD_PTCP
'Mary said that s/he had come home.'

(23) ??*Selleks on mul täielik tõendusmaterjal.*
This-TRANSL be.3S I-ADE complete[NOM] evidence[NOM]
'I have full evidence for it.'

(24) *Selleks ei ole mul täielikku tõendusmaterjali.*
this-TRANSL NEG be I-ADE complete.PART evidence.PART
'I do not have full evidence for it.'

The continuation 'I have full evidence for it' (23) also stands for any other phrase with a content that reflects an expectation in the given context, or the general set of expressions of full evidence, for instance, the ones discussed in the previous section, *ma nägin seda ise pealt* 'I saw it myself', or *tean/kuulsin seda kindlast allikast*

10. The patterns with *verba dicendi* are as follows: [x said that y V-evid], [x said that y V-fin], [x said y V-evid].

'I know/ I've heard it from a reliable source'. These phrases are felicitous as continuations if understood to be uttered about the saying event (expressed by the matrix predicate) and unfelicitous if uttered about the coming home event (base predicate). On the contrary, the continuation 'I do not have full evidence for it' (24) is felicitously interpreted to pertain to the event described in the embedded base predicate. The test in (24) stands for the opposite of the test in (23), for instance, *ma ei näinud seda ise pealt* 'I did not see it myself', *ma ei tea/ei ole seda kuulnud kindlast allikast* 'I know/ I've heard it from a reliable source', but it is also possible as a test involving no negation, such as in the case of less reliable media of perception for the given event, *ma kuulsin seda kaugelt* 'I could hear it from far away'.

The existence of the unmarked sentence (25) containing a verb of saying in the matrix suggests that it is not the presence of *verba dicendi* and quote or report that determine the encoding of the embedded verb in (22) and (25) – both contain a saying verb in the matrix predicate.

(25) *Mari ütles, et ta tuli koju.*
M[NOM] say-3S.PST that s/he come-3S.PST home.ILL
'Mary said that s/he had come home.'

(26) *Selleks mul on täielik tõendusmaterjal/*
this-TRANSL I-ADE be-3S complete[NOM] evidence[NOM]
ei ole täielikku tõendusmaterjali.
NEG be complete.PART evidence.PART
'I have/ do not have full evidence for it.'

Differently from Example (22), the continuations of the sentence without an embedded partitive evidential verb in (25) are felicitous with the equivalents of: 'I have full evidence for it' and 'I do not have full evidence for it'. It is not the report that matters for the encoding. Instead, in (22), the speaker believes that Mary's evidence does not live up to the expectations of full evidence, or that Mary is generally a medium that classifies as providing insufficient evidence (she is blind, has a conflict of interests, or is a liar). In Example (25) without the partitive evidential, the speaker conveys nothing about his or her judgment about the completeness of the evidence.

It is possible to explain the minimal pair in modal terms. An acceptable extension to sentence (22) with the partitive evidential is 'in fact, I don't fully believe that she came', while 'in fact, I fully believe that she came' is contradictory, as in (28).

(27) *Mari ütles, et ta olevat koju tulnud.*
M[NOM] say-3S.PST that s/he be-PART_EVID home.ILL come-NUD_PTCP
'Mary said that s/he had come home.'

(28) *Tegelikult, ma ??arvan / ei arva täielikult, et ta tuli.*
really I[NOM] think-3S NEG think completely that s/he come.3.S.PAST
'In fact, I do/I don't fully believe that she came.'

The application of a more direct test that is constructed to address beliefs, combined with adverbs that express completeness – such as *täielikult* 'completely, fully' – show that the use of the partitive evidential excludes complete belief.

The indirectness hypothesis does not hold for *verba dicendi*. Report does not trigger the partitive evidential in (25), and epistemic meanings emerge in (27). In (25), the speaker believes that Mary's evidence is sufficient and that Mary is a reliable medium. Report as such does not provide either a necessary or a sufficient condition for the use of the partitive evidential here. In a way, indirect evidence can even still count as complete evidence. These data indicate the weakness of the reported hypothesis for the *verba dicendi* class. They provide support for an epistemic modal and partitive based analysis in terms of insufficient degree of evidence for the event with regard to the expectation about complete evidence. Complete evidence would be in typical cases direct perception, or inference, where the speaker's attitudes can be consequently based on.

7. Mental epistemic verbs

The reportative-quotative construction, where the partitive evidentials are embedded under matrix clauses with *verba dicendi,* is merely one of the environments of the occurrence of this morpheme. The analysis in the previous section may be extended to several mental epistemic matrix verbs such as *arvama* 'think, have an opinion', *uskuma* 'think, believe', which can be used as *verba dicendi*, illustrated in (29). The test sentence in (30) and (31) shows that sentence (29) is like (22) with the partitive evidential and unlike sentence (25) without one.

(29) *Mari arvas end kodus olevat.*
M[NOM] think-3S.PST self.PART home.INE be-PART_EVID
'Mary thought that she was at home.'

It is odd to continue the sentence with 'I have full evidence for it' (or its specifications), as in (30). The opposites, as in (31), are not odd.

(30) ??*Selleks on mul täielik tõendusmaterjal.*
this-TRANSL be-3SG I-ADE complete[NOM] evidence[NOM]
'I have full evidence for it.'

(31) *Aga selleks ei ole mul täielikku tõendusmaterjali.*
But this-TRANSL NEG be I-ADE complete.PART evidence.PART
'But I do not have full evidence for it.'

Applying the more direct tests that address beliefs and contain completion adjectives or adverbs, 'In fact, I don't fully believe that she was' in (32), encoding less than full belief, indicates an acceptable sequence of sentences while (33), asserting full belief, 'In fact, I fully believe that she was,' does not.

(32) *Tegelikult, ma ei arva päris/täielikult, et ta oli.*
'In fact, I don't fully believe that she was.'

(33) ??*Tegelikult, ma arvan täielikult, et ta oligi.*
'In fact, I fully believe that she was.'

The explicit expression of incomplete evidence for the propositon, as in (29), contrasts with (34), which contains the mental epistemic verb and a complement clause representing the proposition, but without the partitive evidential. Like with *verba dicendi*, the complementation without the partitive evidential is possible.[11]

(34) *Mari arvas, et ta on kodus.*
M[NOM] think-3S.PST that s/he[NOM] be.3S home-INE
'Mary thought that she (herself) was at home.'

Sentence (34) can be followed by all test sentences, as seen in (35)–(38).

(35) *Selleks on mul täielik tõendusmaterjal.*
this-TRANSL be-3SG I-ADE complete[NOM] evidence[NOM]
'I have full evidence for it.'

(36) *Aga selleks ei ole mul täielikku tõendusmaterjali.*
But this-TRANSL NEG be I-ADE complete.PART evidence.PART
'But I do not have full evidence for it.'

(37) *Tegelikult, ma ei arva päris/täielikult, et ta oli.*
'In fact, I don't fully believe that she was.'

(38) *Tegelikult, ma arvan täielikult, et ta oligi.*
'In fact, I fully believe that she was.'

In (35)–(38), the indicative marking is underspecified with respect to the completeness of the evidence in these tests if applied to the constructions of verbs of saying and mental attitude; the meaning of complete evidence is an implicature. The sentences with the partitive evidential cannot appear with continuations that express complete evidence and full belief. On the other hand, incomplete evidence and insufficient belief cannot provide the sufficient conditions for partitive evidential encoding. As the 'quotatives' with *verba dicendi*, the mental epistemic verbs easily lend themselves for an epistemic modal analysis and the indirectness hypothesis

11. Constructions with mental epistemic verbs have the following patterns: [x thinks y V-evid] and [x thinks that y V-fin]. The pattern [x thinks that V-evid] is missing.

is less plausible. The sentences with the partitive evidential express the incomplete nature of the evidence for the situation, while there is a contextually determined or a standard expectation of complete evidence for the situation.

8. Visual evidence and other types of sensory evidence: *Verba sentiendi*

Previous sections compared the occurrences of the partitive evidential in its independent uses, with *verba dicendi* and with mental epistemic verbs and established that there is a discrepancy between an expectation – the contextually determined complete evidence – and the speaker's evaluation of and belief about the available evidence. Complete evidence could also be provided by a report or an inference. In the previous sections, the main tests for complete evidence included visual perception. This section concentrates on perception verbs. Does visual evidence indeed constitute complete evidence for all types of events, and how do other types of sensory evidence compare to visual evidence? How much does the fact that the event is not directly seen determine the incompleteness of the evidence?

I hypothesize that the types of evidence form a scale of vision>hearing>other sensory perception, as attested in many morphologically explicit evidential systems. In many types of evidential systems, the speaker specifies what kind of evidence he has, that is, what is the source of his information. In some evidential systems, visual evidence differs from auditory or other sensory evidence, providing either stronger or a differentiated type of evidence, which results in different marking. That the Estonian embedded predicates that denote complete evidence are encoded differently from those that have incomplete evidence has remained unnoticed yet. In Modern Estonian, the predicate marked with the partitive evidential is anomalous in combination with a vision verb in the matrix clause if the sentence is used out of context (39).

(39) # *Mari* *nägi* *teda* *koju* *tulevat.*
M[NOM] see-3S.PST him/her.PART home.ILL come-PART_EVID
Intended meaning: 'Mary saw him/her come home.'

Instead, it is the *m*-stem non-finite inessive verb form (the *mas*-infinitive) (40) that is grammatical with vision verbs in the matrix clause.[12]

12. The *m*-stem non-finite inessive verb form (the *mas*-infinitive) is the form of the progressive and in different contexts it is also the form of the absentive in Estonian. Constructions of sensory evidence have the following patterns: [x perceives y V-mas], [x perceives that y V-fin], [x perceives y V-evid]. The middle (unaccusative) forms optionally contain the partitive evidential. The patterns are as follows: [y seems V-evid], [seems, that y V-fin].

(40) *Mari* *nägi* *teda* *koju* *tule**mas**.*
M[NOM] see-3S.PST him/her.PART home.ILL come-MAS_INF
'Mary saw him/her come home.'

On the contrary, given the same base event that can be seen, heard and sensed (*e.g.*, as in a situation where the giant comes home and the house is shaking and there are audible footsteps); the partitive evidential is grammatical with acoustic and other sensory perception verbs (41), (42).

(41) *Mari* *kuulis* *teda* *koju* *tule**vat**.*
M[NOM] hear-3S.PST him/her.PART home.ILL come-PART_EVID
'Mary heard him/her come home.'

(42) *Mari* *tundis* *teda* *koju* *tule**vat**.*
M[NOM] sense-3S.PST him/her.PART home.ILL come-PART_EVID
'Mary felt/sensed/smelled etc him/her come home.'

Acoustic and other sensory perception verbs in the matrix clause are anomalous in combination with the *mas*-infinitive form (43), (44).

(43) # *Mari* *kuulis* *teda* *koju* *tule**mas**.*
M[NOM] hear-3S.PST him/her.PART home.ILL come-MAS_INF
Intended meaning: 'Mary heard him/her come home.'

(44) # *Mari* *tundis* *teda* *koju* *tule**mas**.*
M[NOM] sense-3S.PST him/her.PART home come-MAS_INF
Intended meaning: 'Mary felt/sensed/smelled etc him/her come home.'

Given these data, visual evidence is set apart from other types of sensory evidence. The question is whether the selection is determined by lexical, grammatical or encyclopedic factors. The data in (45) suggest that, as with the constructions with mental epistemic verbs and *verba dicendi*, there are idiosyncratic lexical-syntactic restrictions on the complementation patterns. The use of the partitive evidential in a complement clause with an overt complementizer has not grammaticalized with perception verbs (45).

(45) * *Mari* *tundis,* *et* *ta* *tulevat* *koju.*
M[NOM] sense-3S.PST that s/he[NOM] come-PART_EVID home.ILL
Intended meaning: 'Mary felt/sensed/smelled etc him/her come home.'

There is an interesting difference between reportative and auditory readings and complementation patterns that arise with the matrix verb 'hear' (46). While the auditory, temporally simultaneous reading ('Mary heard him/her come home') is not possible in a *that*-complement clause with the partitive evidential, the reportative reading is, in a construction referring to two temporally distinct events ('Mary heard that s/he would come home').

(46) *Mari kuulis, et ta tulevat koju.*
M[NOM] hear-3S.PST that s/he[NOM] come-PART_EVID home.ILL
Intended meaning: *'Mary heard him/her come home.'
'Mary heard (from someone) that s/he would come home.'

The example suggests that the partitive evidential unites several types of incomplete evidentiality, but the distinct patterns encode additional temporal and other semantic restrictions.

While the explanation of these restrictions is beyond the limits of this paper, it is important to point out that they exist and yield the question of the interdependence between evidence types, perception and the properties of the base events. The following tests aim at clarifying the semantics containing perception verbs and describing events that can be seen, heard and sensed. I wish to find out if evidence can be understood in terms of a scale on which the types of evidence vary in strength, and next, if visual evidence corresponds to the maximal degree of evidence for all events. The tests try to establish if there is an implicational scale ordered according to the completeness of evidence. The test is based on the Gricean maxim of quantity, which requires the Speaker to be maximally informative. If the Speaker chooses to use a term that is weaker on a scale of evidence, there is a scalar implicature that he cannot communicate evidence that is mapped to a stronger term on the implicational scale. If vision is the strongest term, then the test would predict for vision verbs that they behave linguistically as the strongest term as well. With vision verbs in the matrix clause, I expect an odd effect with the continuation with 'even' and the information that Mary was unable to hear or sense the event. The odd effect would arise since the information about hearing or sensing the event is less informative than the information about seeing it. In case of auditory verbs, the test would predict the felicity of 'even', negation and the vision verb; auditory verbs are predicted to create an odd effect with 'even' and the other sensory perception verbs. If someone is reported to have sensed an event, the implicature is that she was unable to hear or see it and the seeing and hearing verbs are predicted to be felicitous with negation and 'even'. These tests are applied in (47)–(49).

(47) *Mari ainult nägi teda koju tule**mas,***
M[NOM] only see-3S.PST him/her.PART home.ILL come-MAS_INF
? *aga isegi ei kuulnud / ?aga isegi e tundnud.*
but even NEG hear-NUD_PTCP but even NEG sense-NUD_PTCP
'Mary only saw him/her come home, ? but did not even hear/sense it.'

(48) *Mari ainult kuulis teda koju tule**vat,***
M[NOM] only hear-3S.PST him/her.PART home come-PART_EVID
aga isegi ei näinud / ?aga isegi ei tundnud.
but even NEG see-NUD_PTCP but even NEG sense-NUD_PTCP
'Mary only heard him/her come home but did not even see/?sense it.'

(49) *Mari ainult tundis teda koju tule**vat,***

M[NOM] only sense-3S.PST him/her.PART home come-PART_EVID
aga isegi ei näinud / aga isegi ei kuulnud.
but even NEG see-NUD_PTCP but even NEG hear-NUD_PTCP
'Mary only sensed him/her come home, but did not even see/hear it.'

Implicatures create a clear scale of evidence types. The results of the test in (47)–(49) show that there is an implicational scale ordered according to the degree of being informative. The scale of the strength of evidence is made up as follows: vision>hearing>other, if applied to events that can be seen, heard and perceived by other senses. Hearing and sensing are weaker terms on the scale, providing a lower degree of strength of evidence. If the speaker reports about Mary that she heard an event of entering the house, then the speaker (again) obeys the Gricean Maxim of quantity in making his contribution maximally informative, communicating that the stronger claim cannot be made. However, this information is still weaker than required according to the expectation. In sum, the partitive evidential does not mark the embedded predicate of the vision verb but it does mark the embedded predicate of other sensory verbs. There is, therefore, a stronger indication that auditory evidence corresponds to a lower degree of evidence compared to the expected complete evidence for the event on the evidence scale. Any other sensory type of evidence corresponds to an even lower degree of evidence. This sensitivity to the strength of evidence is reflected in the grammatical marking.

However, using different verbs, such as *mängima* 'play (an instrument, or a song)' shows that the type of events matters for assessing the strength of evidence and consequently, the grammaticality of the form used. In Example (50), there is an audible event for which the evidence is acquired via auditory means of perception, for instance, if music is heard over the radio. The embedded predicate is encoded with the *mas*-infinitive.[13]

(50) *Ben kuulis Amyt mängimas Meat Loafi hittlugu "I'd Do*
B[NOM] hear-3S.PST A.[PART] play-MAS_INF ML.GEN hit.PART [TITLE]
Anything For Love".
'Ben heard Amy play the hit of Meat Loaf, "I'd Do Anything For Love"'.

Vision can provide full evidence if the salient properties of an audible event require vision. This is the situation where small children see the curious form and sound of the cither, which inspires them to choose it as their musical instrument

13. http://www.u-pop.ee/artist/artistview/184/full

in music school. The base verb is not encoded with the partitive evidential in that case (51) (exact glossing is omitted for irrelevant parts).[14]

(51) *Kaks esimest teadsid juba enne muusikakooli tulekut,*
The first two knew already before coming to the music school
et tahavad just kannelt õppida,
that they wanted to study cither
Viivika nägi kord koolimajas õpetajat mängimas
V[NOM] see-3S.PST once school.INE teacher.PART play.MAS_INF
ja leidis oma suuna just siis.
and found her calling right then
'The first two knew already before coming to music school that they wanted to study cither; Viivika once saw the teacher playing [the cither] at school and found her calling right then.'

If the perception is unclear, the partitive evidential is used regardless of perception type. This can be true for vision, if vision cannot give complete evidence about reality, such as in dreams or revelations, as in (52)[15] and (53)[16] respectively.

(52) *Tarmo unenägude paremikku kuulub ka uus Harry Potteri köide,*
To the best of Tarmo's dreams also belongs the new volume of Harry Potter
mille pealkirja ta nägi olevat Harry Potter
which.GEN title.PART s/he[NOM] see.3.S be-PART_EVID HP[NOM]
ja räimed
and Baltic_herring-PL
'To the best of Tarmo's dreams belongs the new volume of Harry Potter, the title of which he saw to be Harry Potter and a Baltic herring'.

(53) *Ta palvetab ja on nägemuses näinud mehe…*
s/he[NOM] pray-3.S and be.3.S revelation-INE see-NUD_PTCP man.ACC
sisse tulevat ja käe ta peale panevat…
in come-PART_EVID and hand.TOT he.GEN upon put-PART_EVID
'He is praying and has seen a man coming in in his dream and putting his hand on his head.'

14. http://uus.www.valgamaalane.ee/260904/esileht/25000357.php

15. http://kodutriibik.blogspot.com/2005/05/tarmo-ngi-sel-unes-et-mul-on-veel-kaks.html

16. http://usumaailm.harta.ee/loe.php?tuup=opituba&id=13

In addition, if the whole perception of an auditory event is disturbed, as in an event of somebody talking at a distance, then, again, the base verb is encoded with the partitive evidential as in (54).[17]

(54) *Ta* *kuulis* *õpetajat* *kusagil* *kaugel-* *kaugel*
s/he[NOM] hear-3.S.PAST teacher.PART somewhere far far
rääkivat *rõõmust…*
speak-PART_EVID joy-ELA
'He heard the teacher speak of joy somewhere far away.'

Also, the whole perception of the auditory event is sometimes markedly different from what was expected. Even if hearing itself is reliable, there is a partitive evidential. This is the case in a horror story about an unnatural hearing event of someone playing the piano, while the player is not seen (55). Direct, reliable vision that gives evidence for an event that proceeds according to an expectation is indeed an important component of complete evidence for perceivable events.[18]

(55) *Mustas* *klaveris* *kuuldakse* *kedagi*
black-INE piano-INE hear-IMPERS someone-PART
(musta *kätt* */* *jalga,* *klaverit* *ennast)* *mängivat.*
black-PART hand-PART foot-PART piano-PART itself-PART play-PART_EVID
'In the black piano, someone (a black hand or foot, the piano itself) is heard playing it.'

In sum, if one can draw conclusions on the basis of the morphological encoding, vision provides complete evidence for events that can be seen, on condition that the perception is reliable. Audible events must also be perceived by vision unless the visible side of the event is toned down as in case of being mediated over the radio, where visibility it is not part of the expectations. The previously applied test can now be extended to a combination of environments, where the audible event is the base, and where two types of information are varied: the form of the base verb and the source of perception.

(56) *Mari* *ainult* *nägi* *teda* *mängimas* */* *mängivat,*
M[NOM] only see-3S.PST him/her.PART play-MAS_INF play-PART_EVID
(?)*aga* *isegi* *ei* *kuulnud* */* ?*aga* *isegi* *ei* *tundnud.*
but even NEG hear-NUD_PTCP but even NEG sense-NUD_PTCP
'Mary only saw him/her play, but did not even (?)hear/?sense it.'

17. http://www.eelk.ee/h_j-madise.html

18. http://www.folklore.ee/rl/pubte/ee/cf/mjap/mare.html

(57) *Mari ainult kuulis teda mängimas,*
M[NOM] only hear-3S.PST him/her.PART play-MAS_INF
?*aga isegi ei näinud /* ?*aga isegi ei tundnud.*
but even NEG see-NUD_PTCP but even NEG sense-NUD_PTCP
'Mary only heard him/her play, but did not even ?see/?sense it.'

(58) *Mari ainult kuulis teda mängivat,*
M[NOM] only hear-3S.PST him/her.PART play-PART_EVID
aga isegi ei näinud / ?aga isegi ei tundnud.
but even NEG see-NUD_PTCP but even NEG sense-NUD_PTCP
'Mary only heard him/her play, but did not even see/?sense it.'

(59) *Mari ainult tundis teda mängivat,*
M[NOM] only sense-3S.PST him/her.PART play-PART_EVID
aga isegi ei näinud / aga isegi ei kuulnud.
but even NEG see-NUD_PTCP but even NEG hear-NUD_PTCP
'Mary only sensed him/her play, but did not even see/hear it.'

The effect of the tests in examples in (56)–(59) is less perspicuous and more context-dependent than the effect of the tests with an event that can be perceived in many ways. In addition, the tests in (56)–(59) show that the scale of strength of evidence for primarily audible events is different in an interesting way. Either vision or auditory perception provides complete evidence, triggering a different context, witnessed by example (56) with a vision verb and (57) with an auditory verb with the base encoded with the *mas*-infinitive form. When an auditory verb appears with the base event encoded with the partitive evidential as in (58), vision can provide stronger evidence. Alongside with that, a context is triggered where the complete evidence must rely on vision, as in an imaginary situation where the piano-playing is also judged upon its visual beauty or it is broadcasted on TV. The other sensory evidence ranks below seeing and hearing (59). In sum, the partitive evidential indeed patterns with examples where the given means of perception cannot give the complete evidence as expected, since it is not the most reliable means for perceiving the salient properties of the given event. Clear scales of strength of evidence are composed for different events. Complete evidence is opposed to incomplete evidence, and reflected in the morphological marking. Crucially, completeness does not mean all possible evidence, but completeness according to an expectation about sufficient evidence.

In addition, the Estonian equivalents of the verb 'seem' as in (60)–(63), which have complement predicates with partitive evidentials, support a different semantic analysis from that of indirectness. The equivalents of the verb 'seem' are originally derived from perception verbs. The exact source of perception has

generally disappeared in the lexical meaning of them, as witnessed by the examples that are constructed with audible events. The exception is *kuulduma* 'be heard', where the source of perception is still part of the lexical meaning.

(60) *Hääl* *näis* *tulevat*
Voice[NOM] seem-3S.PST come-PART_EVID
mu *enese* *pea* *seest.*
I.GEN own.GEN head.GEN inside-ELA
'The voice seemed to come from the inside of my own head.'[19]

(61) *Piiksatused* *paistsid* *tulevat* *otse* *kivist.*
Squeak[NOM]PL seem-3S.PST come-PART_EVID directly stone-ELA
'The squeaks seemed to come right out of the stone.'[20]

(62) *Kukki* *kuuldus* *külas* *olevat* *sadu,*
Rooster.PART.PL seem-3S.PST village-INE be-PART_EVID hundred.PART.PL
(mõni häälitses üpris kummalise ärajoodud häälega.)
(some made quite strange drunken sounds)
'There seemed to be hundreds of roosters in the village, some of them made strange drunken sounds.'[21]

(63) *Heli* *tundus* *tulevat* *koopast.*
Sound[NOM] seem-3S.PST come-PART_EVID dungeon-ELA.
'The sound seemed to come from a dungeon.'[22]

The analysis developed in the previous sections can be extended to the example set (60)–(63) as well. The meaning of the verb 'seem' does not encode reportative or any other type of indirectness, but the existence of incomplete evidence as opposed to the expected complete evidence. This language-internal semantic category has more in common with the cross-linguistically attested category of epistemic modality, since the semantic analysis relies on mental attitudes such as expectations and strength of evidence.

19. Source: http://www.physic.ut.ee/~larry/mardus/autorid/simpson/TULEK.html

20. Source: http://hpworld.forumsplace.com/archive/o_t__t_75__fan-rollim%C3%A4ngud.html

21. Source: http://www.loodusajakiri.ee/eesti_loodus/artikkel877_858.html

22. Source: http://www.obs.ee/cgi-bin/w3-msql/algernon/jutt.html?id=74

9. Partial access to the relevant course of events: Unexpected results and *verba sentiendi*

In order to separate the notions of indirectness and incomplete evidence, more examples are needed of a type of incomplete evidence that is not simultaneously indirect. These examples are provided by situations where the evidence of the concrete event as described by the predicate is complete. Simultaneously, the event is only the final part of a sequence of related events for which there is no reliable evidence. Section 8 demonstrated that partitive evidential marking does not appear with complete evidence, for instance, with vision verbs and the conditions of perfect visibility. Considering the examples in Section 8, it is unexpected that visual perception verbs may still be compatible with the partitive evidential marked predicate and a situation of perfect visibility described in (64).

(64) *Mari* *leidis/nägi* *end* *kodus* *olevat.*
M[NOM] find/see.3S.PST self.PART home-INE be-PART_EVID
'Mary found herself at home. Mary saw that she was at home.'

The only way for sentence (64) to have an interpretation is when the situation is presented as the result of some previous relevant events that cannot be properly reconstructed into what is expected to be the required whole of events that lead to what is presented as a result state in (64).[23] The example comes close to mirativity and past inferentials in other languages, as in example (65) from Khowar (Bashir 2006: 34) (glossing retained as in the original).

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23. There seems to be a recent language change (Tamm 2008a). While Uuspõld (1969, 1985) has examples combining the verb *leidma* 'find' and verb marked with a *vat*-evidential (i), a present day user would prefer an elative-marked *m*-infinitive instead of the evidential (ii) in neutral contexts where no complement set of relevant events is evoked or where the visual perception of event is not obscured; rather, the location of the event is unexpected. As situations of finding are typically interpreted to be verified by vision, the use of the partitive evidential has become infelicitous and in need of pragmatic conditioning containing special circumstances, as described above.

(i) *Leidis* *poisi* *mängivat.*
Find-3S.PST boy-PART play-PART_EVID
'S/He found that the boy was playing.'

(ii) *Leidis* *poisi* *mängimast.*
Find-3S.PST boy-PART play-MAST_INF
'S/He found that the boy was playing.'

(65) *awá* *oreéé*ɪ *asít-am* *angáh* *hótam*
I sleep(PST PERF-D-1S) awake become(PST-D)-1S
ki *xúur* *kos* *dúr-a* *asteé-am*
I.saw.that other someone(OBL) house-LOC be(PST-I)-1S
'I had fallen asleep. When I awoke I realized that I was in someone else's house.'

Crucially, the evidence is not available for the full course of the relevant previous events that lead to the situation. There is a complement set of relevant events that is evoked as a presupposition in addition to the event or state described in the sentence. In sentence (64), Mary does not know or did not see how she ended up at home. A plausible situation to illustrate Example (64) is Mary opening her eyes and seeing that she was at home, but the events that brought her there were either wiped form her memory or inaccessible because she had been blind or blindfolded or in a dream. From among the relevant events that provide evidence for the whole situation, only the final result is perceived. The speaker does not know how she ended up at home, but she presupposes that there were events that lead to that situation. Note that this use has not much to do with beliefs or degrees of confidence about the proposition 'Mary is at home'. The speaker believes the proposition fully, which can be verified by the test of complete belief as applied in (37). The test of incomplete evidence, as in (24), can be applied if reworded to suit this context, as follows: *Mul ei ole kõikide asjassepuutuvate sündmuste kohta täielikku tõendusmaterjali* 'I do not have complete evidence about all the relevant events in this situation'. This wording would emphasize the lack of complete evidence; its affirmative counterpart would be odd as a continuation of Example (64).

The sentence is not a report either. The account of Northern Ostyak indirect evidence in Nikolaeva (1999) is based on the idea that the situation of getting the evidence about the event must not be identical to the event itself. Indeed, the relevant relationships seem to hold between events that contribute to getting the evidence. However, the relevant relation in these data is that the described event is part of a number of events that are required to contribute to getting evidence about the situation. More specifically, the final result state (being at home) is a part of a required full set of relevant events that are necessary to construct full evidence. The rest of the events that constitute evidence is missing from the relevant evidence set (*e.g.*, leaving the working place, walking home, opening the front door, stepping in). The relevant set of events precede but also include the given result state (e.g., leaving the working place, walking home, opening the front door, stepping in, AND being at home). In this sense, the partitive has a truly partitive interpretation in Example (64). Again, the strength of the evidence does not amount to the expected degree. A partitive analysis is superior to an indirectness based account but via the notions of expectations and strength of evidence, compatible with an epistemic modality account.

10. Factors reducing the strength of evidence and the partitive evidential occurring with direct evidence

Section 8 and 9 showed that vision verbs do not appear with the partitive evidential base verb without special contexts, such as memory loss, dreams, or revelations. If evidence is complete, the base verb of a matrix vision verb is marked with the *mas*-infinitive morpheme, as the contrast between (39) and (40) demonstrates. In addition to special contexts, there are lexical devices that can be pinned down as elements that contribute to the reduction of the evidence. In Examples (54) and (55), the reduced strength of evidence was highlighted by the use of lexical items such as *kusagil* 'somewhere' and *kedagi* 'somebody'. This subsection discusses impersonalization as a grammatical device that contributes to the reduction of the strength of evidence. In an impersonal sentence, the identity of the agent is not presented by the speaker. This device may reduce the strength of evidence about the event. An impersonal sentence where the identity of the experiencer is not disclosed has an embedded base verb with partitive evidential encoding, as exemplified in sentence (66).

(66) *Marit* *nähti* *koju* *tulevat.*
M.PART see-IMPERS.PST home-ILL come-PART_EVID
'Mary was seen to come home.'

Impersonalization (66) changes the properties of sentences with vision verbs, which is an effect that is difficult to account for in terms of indirectness but not in terms of an analysis that relies on the degree of strength of evidence. In case of impersonalization, the speaker-message relationship remains identical. The contextually fixed expectation of the strength of evidence that is compared to the actual evidence provides a better ground for the explanation of the choice for the form of the base verb. In addition, no syntactically or lexically stated restrictions can be established between the impersonal and the partitive evidential, since there still is variation in the choice of the form of the base verb, as witnessed by (67).

(67) *Teda* *nähti* *koju* *tule**vat**/tule**mas**...*
him/her.PART see.IMPERS.PST home come-PART_EVID /come-MA_INF
'S/he was seen to come home.'

The evidence is just more likely to be incomplete if the speaker has no clearly identifiable perceiver (or the speaker is more likely to simultaneously present evidence as incomplete and not to disclose the identity of some participants in the event). Specification about a possible perceiver clearly adds evidence. In (68), the continuation 'George was at home then' is understood as 'George was a witness of the base event' if the *mas*-infinitive is chosen in (67) and as not witnessing the base event if the partitive evidential is chosen.

(68) *Jüri oli siis kodus (ja nägi).*
J[NOM] be.3S.PST then home-INE and see.3S.PST
'George was at home then,' the continuation of (67) with the partitive evidential)
('George was at home then and saw it,' the continuation with the *mas*-infinitive (67))

Also, a focus on the vision verb eliminates the variation (69), and only the *mas*-infinitive form is compatible with focusing the source of evidence that is normally associated with complete evidence.

(69) *Teda 'nähti koju #tulevat/tulemas.*
him/her.PART see.IMPERS.PST home.ILL come-PART_EVID/come-MAS_INF
'S/he was seen come home.'

Therefore, an analysis in terms of the strength of evidence can be preferred over a solely indirectness or modality (belief) based approach to the semantics of the partitive evidential.

11. Summary of the data analysis and discussion

In all examples with the partitive evidential, it was shown that the speaker presents the evidence for the event as incomplete in comparison to the expectation. The following summarizes the uses of the partitive evidential.

The partitive evidential appears in embedded environments and has an independent use as well. The independent use is compatible with Aikhenvald's (2004) definition of reported (indirect) evidentiality, but it does not exclude epistemic modality. This form is not an inferential. Contexts expressing inferential evidentiality are incompatible with the partitive evidential, and modifying the partitive evidential predicate with an inferential adverb is anomalous. The evidential is not a pure reportative, but a reportative combined with a judgment of incomplete evidence (or the speaker's decision to present the evidence as such). The independent use of the partitive evidential presupposes another speaker of the proposition *p*, and an expectation about sufficient, complete evidence for *p*. It asserts that the evidence for *p* is incomplete. The evidence can but does not have to be incomplete, because it is provided by the mediation of another speaker.

Combinations of an embedded partitive evidential verb and *verba dicendi* are the basis for the meaning extension to reported evidentiality in independent, non-embedded clauses. The partitive evidential encoding of the base verb of the matrix verbs of saying may be understood as an instance of embedded reportative. However, the existence of the indicative clause containing a verb of saying in the

matrix suggests that report is not a necessary or sufficient condition for encoding partitive evidentials. Semantically incomplete (indirect) evidence can still count as complete evidence as far as morphological marking is concerned in embedded environments with the equivalent of the Estonian *that*-clause, or when used independently. Only indirect evidence triggers the morphological marking of the partitive evidential in an independent environment or in a complement *that*-clause. The rest of the occurrences are control or raising constructions. On the one hand, the partitive evidential encodes that evidence may be incomplete because it is indirect, uncertain, or not perceived by the appropriate combination of senses. On the other hand, those factors do not determine the morphological encoding, but a range of morpho-syntactic encodings, one of which contains the partitive evidential. The morphological form has its distinct semantics, but this distinct semantics does not necessarily trigger the morphological form. The sentences with the verbs of saying, mental epistemic or perception verbs and a partitive evidential express incomplete evidence for the situation, while there is a contextually determined expectation about complete evidence for the situation.

The perception verbs form a scale ordered according to the strength of evidence. The scale is partly dependent on encyclopedic knowledge about which type of evidence is more relevant for a certain type of event. Testing the sentences with the partitive evidential and matrix perception verbs has shown that the evidence forms a scale, with visual evidence corresponding to a sufficient degree of evidence; auditory evidence corresponds to a lower degree and any other sensory type of evidence corresponds to an even lower degree of evidence on the evidence scale. The data show that either vision or auditory perception provides complete evidence, depending on the properties of the event. The difference is clearly reflected in the morphological encoding of the base. The choice is between the partitive evidential and the *mas*-infinitive form. When an auditory verb appears with the base event encoded with the partitive evidential, vision can provide stronger evidence in pragmatically conditioned sentences. For instance, a context is triggered where the complete evidence for an auditory event must rely on vision, as in an imaginary situation where the piano-playing is also judged upon its visual beauty or watched on TV. The other sensory evidence ranks below seeing and hearing. In sum, the partitive evidential occurs with examples where the given means of perception cannot give the complete evidence as expected, since it is not the most reliable means of perceiving the given event. Clear scales of strength of evidence are composed for different events. Complete evidence is opposed to incomplete evidence, and reflected in the morphological marking. Those examples are relevant, since they show the relativity of complete evidence. Complete evidence is not to be understood as all possible evidence available in the imagination of the speaker. Instead, the completeness of evidence is defined in comparison to

an expectation about sufficient evidence for each particular event in its each particular setting.

Support for a partitive based analysis comes from constructions with vision verbs and verbs such as 'find'. In those constructions, there is no complete evidence for the expected, complete course of the relevant, related, previous events that led to the situation. In an example sentence, the subject is described in a situation where the access to the events that led to the final state is impossible. It is not known how the subject ended up at home, but it is presupposed that there were events that lead to that situation. In addition, modal and indirectness approaches are difficult with other instances where the degree of evidence is toned down. In addition to special contexts, such as dreams, revelations, weird unexpected situations as in horror stories, there are devices that can be pinned down as elements that contribute to the reduction of the strength of evidence and partitive evidential encoding. For instance, referentiality is reduced by the lexical items such as *kusagil* 'somewhere' and *kedagi* 'somebody,' or by means of impersonalization.

The specific semantics of the partitive evidential has evolved as a consequence of its historical development from an aspectual partitive object. In case of evidentiality, the morphological encoding is sensitive to the strength of evidence for the event; in case of aspect, the morphological encoding is sensitive to the degree of event realization. The forms without partitive reflect a match between the expectations and the knowledge, judgment or presentation about the actual event. In an indicative sentence, the strength of evidence is sufficient as an implicature; this degree of strength of evidence defines the maximal point on the scale of strength of evidence for the event. In a sentence with the total object case, the event has an endpoint that has been reached; therefore, the realization of the event is sufficient as compared to the expectation. The partitive forms encode that in comparison to the expectation, the reality falls short – the maximal point or degree on the scale is not reached. On the scale of evidence, the strength of evidence does not amount to the defined maximum. On the scale of event realization, the event has not reached the endpoint, the maximal point, either. In other words, partitive encodes that something is less than the expectation, or incomplete. In case of the partitive evidential, it is the evidence for the event, and in case of the partitive object, it is the realization of the event. Table 2 represents the parallel between aspect and evidentiality.

Table 2. Events, evidence, and partitive

	Partitive marking	**No partitive marking**
Evidentality	incomplete evidence	complete evidence
Aspect	incomplete event	complete event

The sections above presented the data that show that the partitive-related scalar analysis that relies on the completeness and strength of evidence and a comparison to the expected evidence can be preferred over a solely indirectness or modality based approaches to the semantics of the partitive evidential. In all discussed cases, the evidence presented in sentences containing the partitive evidential does not add up to the expected evidence on a scale. The maximal point of this scale of strength of evidence is defined by an expectation about sufficient, complete evidence.

12. Summary

The Estonian evidential, epistemic modal and aspectual categories share similarities as the result of the diachronic development of the partitive case. The Modern Estonian partitive evidential is originally an instance of aspectual case-marking. More specifically, it was a partitive-marked personal or impersonal present participle. The partitive case started off as an instance of a semantic separative case marking, developing into aspectual case marking, and through a stage of subjunctive-conjunctive, followed by a stage of epistemic modality marking of embedded predicates, gradually crystallized as a reportative evidential in the Estonian system. These stages of the development of the partitive case are still visible in Modern Estonian examples. In Modern Estonian, partitive is cross-categorial, being part of forms that mark different lexical and functional classes–main predicates, embedded predicates, and objects. The claim of this paper is that the semantics has developed in a strikingly uniform way, but in different functional categories and semantic domains. The Estonian partitive evidential comprises evidential and epistemic modal meanings. The partitive forms have transparent scalar semantics in both categories, denoting either an incomplete event or incomplete evidence. Incompleteness is understood as an insufficient, non-maximal degree of event realization or insufficient strength of evidence compared to the speaker's expectation of a completed event or complete evidence. Expectations about completed events and complete evidence define the upper bound to the scales related to event realization and strength of evidence. The partitive evidential encodes a difference between the degree of strength of evidence available to the speaker and what the speaker fixes as the upper bound of the scale, the maximal degree of required evidence for (the relevant details of) the event in its context. The phenomena related to the partitive evidential show that the partitive semantics has not only carried over from the NP domain to the predicate aspectual domain, but it has pervaded the Estonian TAM system

more deeply than previously assumed, providing support for those approaches that regard partitive as a semantic case.

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