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30. Tense Aspect Mood

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1. Introduction

In the framework of cognitive linguistics we approach the grammatical categories of tense, aspect, and mood from the perspective of general cognitive strategies. Like most

linguistic categories, the three grammatical categories of verbs discussed here display polysemy. The cognitive strategies relevant for polysemy are metaphor and metonymy, which help to structure radial categories by motivating extension from prototypical meanings (Lakoff 1987). Therefore metaphor and metonymy play an important role in the structure of tense, aspect, and mood categories. For verbal categories, reference to extralinguistic knowledge from domains like reasoning, probability, and hypothesis are particularly important, as are considerations of pragmatics. As a result, the same situation can be encoded differently in terms of tense, aspect, and mood in accordance with the speaker's construal of the situation. Cross-linguistically the categories of tense, aspect, and mood vary, though prototypes tend to be similar across languages.

The structure of grammatical categories of tense, aspect, and mood is motivated by a number of phenomena that are treated in more detail in other chapters in this volume. I refer in particular to Gries' chapter on Polysemy, Gibbs' chapter on Metaphor, Barcelona's chapter on Metonymy, and Taylor's chapter on Prototype effects. Although all three categories are dependent on how human beings conceptualize time, the topic of Evans' chapter in this volume, none of them merely encode parameters of reality, but instead are subject to the forces of construal, which is the topic of Langacker's chapter.

Tense reflects the speaker's experience of the sequencing of events. This alignment is inherently metaphorical, since tenses are conceived of in terms of regions along a timeline, which can be oriented and structured differently in different languages. In other words, tense is a metaphorical location of events with respect to a point of reference. Past and present are primary in that they are both available to the speaker; the past is relatively distant with respect to the present, while the future is both distant and unavailable. Tense is not rigidly defined by event time: many types of metaphoric shift are possible, as in (1), where present tense refers to a future event.

- (1) *I am flying to DC next week.*

Aspect is the grammatical expression of the experience of change (perfective) or lack thereof (imperfective), evaluated through the cognitive process of mental scanning. The speaker views the situation either in a summary fashion (perfective), or as a relationship that is extended in time (imperfective), and can construe the same situation differently in accordance with narrative and pragmatic intents. Aspect additionally includes the progressive and various types of Aktionsart (referring to modifications of the internal temporal constituency of an event). Verbs can have inherent (lexical) aspect, since some verbs, like *give*, are inherently more punctual or completive than others, like *love*. In addition, the arguments of the verb can contribute to the aspectual interpretation of an event, as we see in (2a) (with a definite subject, a singular object, and a perfective interpretation) vs. (2b) (with an indefinite subject, plural object, and an imperfective interpretation).

- (2) a. *The writer wrote a book.*
 b. *A writer writes books.*

Mood (and more generally modality) expresses the speaker's attitude toward the situation, most often in terms of force dynamics, where we see a force opposition between an agonist and an antagonist. Modal expressions are subjectively construed (offstage)

grounding elements that refer to (potential) events beyond the bounds of the speaker's conceptualization of reality. While root (deontic) meanings of modals are motivated by the concrete experience of opposing forces (an embodied experience, cf. Bergen's chapter in this volume) and their extension to the domain of authority and permission as in (3a), modals are further metaphorically extended in epistemic uses to other domains such as reasoning as in (3b). The expression of modality is not limited to modal verbs, but includes imperatives, conditionals, subjunctives, counterfactuals, and a variety of impersonal constructions.

- (3) a. *You must be home by midnight.*
 b. *That must be John.*

This chapter first describes how core concepts of cognitive linguistics have shaped the analysis of tense, aspect, and mood, and then turns to interactions between the three categories. Sections 2 and 3 of this chapter take a thematic approach, exploring how studies in cognitive linguistics have used metaphor and construal to frame analyses of tense, aspect, and mood. Section 4 presents some studies of how tense, aspect, and mood interact with each other.

This chapter presents only selected highlights from the study of tense, aspect, and mood from the perspective of cognitive linguistics. It does not discuss human conceptualization of time in any detail beyond that necessary to address tense, aspect, and mood. The reader is referred instead to Evans' chapter on Time in this volume. References to work on tense, aspect, and mood outside of cognitive linguistics are sparse and no attempt is made to compare achievements across linguistic traditions. This chapter also does not present a typological overview of tense, aspect, and mood phenomena in the world's languages, since such information can be found in other sources (e.g., Dahl 1985; Binnick 2012; Narrog 2012).

I follow Croft (2012: 34) in using the term "event" to refer to all kinds of situations described by verbs. Following this tradition, I also use capitalized terms to refer to language-specific grammatical categories (like the Russian Perfective and the English Progressive), and lower-case terms to refer to categories in a more general sense (like perfective, progressive).

2. Metaphor: EVENTS ARE (PHYSICAL) OBJECTS

Implicitly or explicitly, tense, aspect, and mood rely upon a metaphorical understanding of events as "objects" in the domain of time. Thus reified, the situations described by verbs are placed in time, their properties are observed, and their relationship to reality is evaluated. The EVENTS ARE OBJECTS metaphor that underlies both the use of tense, aspect, and mood by speakers and its investigation by linguists is motivated as a special instance of the TIME IS SPACE conceptual metaphor that is probably universal in languages, although its concrete realizations are language-specific (Haspelmath 1997). Dahl (2013) takes a somewhat different perspective on the relationship between the domain of time and its "objects". He argues that it is our human ability to reify events as objects that makes it possible to understand not only their relationship to time, but time itself:

telic transitions between states are the cognitive constructs that themselves create the temporal dimension. One can thus view the timeline either as accompanied by a succession of events or as constituted by those events.

The comparison of events with objects makes it possible to treat verbs and nouns as parts of a single continuum. This continuum overlaps formally, of course, in the existence of deverbal nouns (such as *a look*) and noun-to-verb derivation or conversion (such as *to calve*). More importantly, this continuum reflects shared strategies in terms of the types of concepts that can be expressed grammatically, such as relative location, boundedness, multiplicity, definiteness, and force-dynamics.

The role of the EVENTS ARE OBJECTS metaphor in both language use and linguistic analysis is unsurprising because the mapping operation of metaphor is among the basic human cognitive mechanisms that motivate language and other cognitive behaviors. In this section, events are referred to as “event-objects” in order to highlight the metaphor that gives coherence to the various parallels observed in connection with the expression of tense, aspect, and mood.

2.1. Tense: event-objects in a timeline

The use of a timeline as a metaphorical “space” for locating event-objects relative to the moment of speech antedates cognitive linguistics (Reichenbach 1947; Comrie 1985). The presence of a mental timeline accounts for correlations between deictic spatial adverbials that can refer to proximal and distal locations and tenses with a similar range of distinctions. However, as Botne and Kershner (2008) show on the basis of Bantu data, the timeline itself can be quite complicated, including distinctions based on Moving Time vs. Moving Ego conceptualizations as well as various conceptual domains.

Time, grammatically realized as tense, is the most basic and first dimension in the linguistic system that connects tense, aspect, and mood. Aspect can be modeled as a second dimension orthogonal to time, dubbed the “qualitative state dimension” in which the contours of event-objects develop (Croft 2012; cf. Talmy 2000 v. II: 67–78; see 3.2 below). Some of the studies described in section 4 (Croft and Poole 2008; Croft 2012: 127–165; Eckhoff and Janda 2014) have yielded quantitative models in which tense and aspect emerge precisely as perpendicular axes in a two-dimensional space. A third dimension, also partly orthogonal to time, is mood, where event-objects directly experienced in the timeline serve to ground reality, against which the non-reality of possible and potential event-objects is judged as a deviation from the basic dimension of time (Langacker 2008: 300–302).

2.2. Aspect: observing the properties of event-objects

Whereas tense can be thought of as a system for investigating *where* event-objects are located on the timeline, aspect can be thought of as a system for investigating *what kinds of* event-objects there are. One can think of physical reality as comprised of two kinds of objects, often grammaticalized as the types of objects that are countable and the types that are not. The analogy between the count vs. mass distinction for nouns and the perfective vs. imperfective distinction for verbs has been observed often (Dahl 1985:

76). Janda (2004) works out this analogy in detail in an account of Russian aspect, with an inventory of fourteen properties of discrete solid objects as opposed to fluid substances that correlate to differences in aspectual usage. For example, discrete solid objects have inherent boundaries but fluid substances do not, and Perfective event-objects have temporal boundaries that Imperfective ones lack. Solid objects can exist as thin slices but fluid substances cannot, paralleled by the fact that punctual events are limited to Perfectives but Imperfectives require some duration. Fluid substances can be mixed together, whereas solid objects can only be adjacent to each other, though they can be embedded in fluid substances and these properties correspond to the various uses of aspect to express simultaneity and sequencing.

Huumo (2005, 2009) explores the properties of event-objects that are relevant for Finnish, which marks aspect by means of case in noun phrases instead of on its verbs. With transitive verbs there is a choice between Restrictive and Partitive case marking on the object. Restrictive case is associated with single, unique objects and with telic aspect. Partitive case is associated with mass nouns, plurals, and with atelic aspect. A conflict arises in so-called “quasi-resultative” sentences where verbs of position, sensory perception, and maintenance of a state, which would be expected to use the Partitive case, use instead the Restrictive case, thus representing the situation as the result of a change rather than as a neutral state (Huumo 2005). Another kind of interaction can arise with the case marking of predicate noun phrases with intransitive verbs. The general rule is that the Nominative case is associated with singular count nouns and represents the subject holistically, whereas the Partitive is associated with mass nouns or plurals and represents the subject incrementally. The aspectual interpretation of deverbal nouns, however, is directly affected by the case usage. Thus (4a) with the Nominative has a holistic interpretation, but (4b) with the Partitive has an atelic incremental interpretation (Huumo 2009).

- (4) a. *Tanssi oli kaunis.*
 Dance-NOM was beautiful-NOM
 ‘The dancing [a specific performance] was beautiful.’
- b. *Tanssi oli kaunist.*
 Dance-NOM was beautiful-PRT
 ‘The dancing [ongoing activity] was beautiful.’

Different languages will of course engage the event-object metaphor in their aspect systems in different ways. Even the closely related Slavic languages show differences in how their aspectual systems are focused. Dickey (2000) observes that two different versions of the event-object metaphor are relevant across the Slavic languages. In the west, Czech, Slovak, and Slovene focus on totality as the interpretation of Perfective as bounded and Gestalt-like. In the east, Russian, Ukrainian, and Bulgarian focus on definiteness as the relevant interpretation; Serbo-Croatian and Polish form transitional zones in this continuum. The distinction between totality in the west and definiteness in the east accounts for a number of differences in the use of aspect, most of which involve more use of the Perfective in the west, where Perfective can mark any action that is completed (including actions that are repeated or coincide with Present tense), whereas such contexts conflict with temporal definiteness in the east and are thus expressed with the Imperfective.

McGregor (2002) offers another perspective on the event-object metaphor by pointing out that in addition to having nominal classifiers, languages can also have verb classifiers. The most relevant type of nominal classifier system is that of numeral classifiers, where the nouns of a language refer to substances and classifiers serve to “unitize” the nouns into discrete objects, sorting the nouns into groups, usually according to the typical shapes of the objects they form. The use of such classifiers is associated with quantifiers and definiteness. McGregor’s analogy links nouns to verbs, and quantifiers to aspect, and although he focuses on Australian languages, he argues that verb classifier systems are probably widespread among the world’s languages, but have been overlooked because they have not been included in the inventory of features that typologists look for. Janda et al. (2013) present a series of statistical studies to support the hypothesis that Russian aspectual prefixes constitute a verb classifier system, which is likely valid for other Slavic languages as well. In addition to the connection between quantifiers and aspect, the verb classifier hypothesis examines distributional criteria and parallels between noun and verb classifier systems. Russian Imperfective verbs refer to unbounded states and activities (like the unformed substances referenced by nouns in numeral classifier languages), which are shaped into discrete Perfective events by aspectual prefixes, which also sort the verbal lexicon into different (though somewhat overlapping) groups. For example, Russian verbs that signal an APART meaning, like *bit* ‘break’ and *krošit* ‘crumble’ perfectivize with the prefix *raz-*, whereas verbs with an ARRIVE meaning like *blizit’sja* ‘approach’ and *celit’sja* ‘aim at’ perfectivize with the prefix *pri-*.

In addition to simple distinctions such as perfective, imperfective, and progressive, other types of event-objects can be identified, and a more detailed inventory is presented in section 3.2.

2.3. Mood and modality: force-dynamics of event-objects beyond reality

Langacker’s model of modality emerges from the conception of reality, its subjective construal, and how these are reflected in the grounding of an event-object. Regardless of whether time is accompanied or constituted by the succession of event-objects, this succession yields a situation in which the past is defined, the present is being defined, and the future is yet to be defined. The human conceptualizer “C” has thus a personal history of experiences that make up immediate reality (along C’s personal timeline), plus what is known to belong to reality but has not been directly experienced (parallel to C’s immediate reality). Beyond reality lies non-reality, where we find event-objects that are suspected or hypothesized. Whereas mood can be thought of as a dimension that runs perpendicular to time in the past and present, both of which belong to reality, the distinction between mood and tense is less clear beyond that, and this is reflected in languages like English that have grammaticalized a modal verb such as *will* to mark future tense.

Modal elements like English modal verbs shift the grounding of the profiled event-object from the basic timeline of tense, such that it is offstage and subjectively construed. In other words, the force of the modal does not bear directly on the event-object itself, but on how it is viewed (in terms of its potential) from the perspective of the ground (Langacker 2008: 300–309). This model, with spaces corresponding to reality and non-reality, is of course a type of mental space model (Fauconnier 1985), in which modal elements serve to set up and structure the mental space that constitutes non-reality.

Mortelmans (2000) and Achard (2002) apply Langacker's model to verbal categories expressing mood, namely the German Past Subjunctive and the French Conditional respectively. These two grammatical categories are used to make a prediction about an event-object that is construed as alternative to reality. Based on knowledge of the structure of reality and its momentum, the speaker assumes that the event-object will not take place, as in (5) (Mortelmans 2007: 880–882).

- (5) *Wenn ich sie kennen würde, würde ich gleich zu ihr gehen und mit ihr reden.* German
Si je la connaissais, j'irais lui parler tout de suite. French
 'If I knew her, I would go and talk to her right away.'

Talmy has investigated the role of force-dynamics in language, which are grammaticalized in the case of modals. An Agonist is an element that exerts a force, an Antagonist is an element that resists a force, and there are various force tendencies and results depending upon whether the force is directed from rest to action or the reverse. Modals like English *must*, *may* express grammatically similar situations of force or blockage that are also expressed lexically in verbs like *make* (*X happen*), *let* (*X happen*). However, the force tendencies of modals are contingent rather than intrinsic. In modal sentences like (6a) and (7a), the force is connected with the Agonist. Non-modal verbs present parallel situations in (6b) and (7b), where the force is connected instead to the Antagonist, which in this case removes a barrier. This model is elaborated to account for modal verbs, their negation, and also understanding of causation (Talmy 2000 v. I: 409–549).

- (6) a. *A flyball can sail out of the stadium.*
 b. *The lack of a dome makes it possible for a flyball to sail out of the stadium.*
- (7) a. *You may go to the playground.*
 b. *I permit you to go to the playground.*

Modal verbs tend to have peculiar syntax, as we see in (7a), where we have what looks like a collapsed two-clause structure. Pelyvás (2011) extends the force-dynamic model of modality to include counterforces and roles that motivate this trend. The “doer” (*you*) has a dual role, as both the passive obligee and the agentive of the potential action. The “imposer” (the speaker) is analyzed as a reference point, which is backgrounded, and this explains why it is unexpressed.

Takahashi (2012) offers a quantitative measure for force exertion according to six parameters (DESIRE, CAPABILITY, POWER, COST, BENEFIT, OBLIGATION) and demonstrates how this measure corresponds to prototypicality for English and Japanese imperatives, since a prototypical imperative like (8a) receives a high score, whereas (8b) receives a low one. A second factor in prototypicality is the subject of the imperative, which is individuated and agentive in a prototypical example, but generic (8c) or non-agentive (8d) in less prototypical uses.

- (8) a. *Do you have a problem? Tell me about it.*
 b. *So you find Tokyo expensive? Tell me about it! A cup of coffee can cost \$ 10.*
 c. *Shake before using.*
 d. *Get well soon.*

3. Polysemy, construal, profiling, and coercion

Whereas the purpose of section 2 was to set up the basic framework for understanding tense, aspect, and mood, this section focuses on how the basic distinctions in each category are further elaborated. As we know, grammatical categories are typically polysemous, and the relations among the meanings of a category are usually motivated by extensions via metaphor and metonymy. In addition, we recognize the fact that language does not merely report the parameters of reality. The speaker selectively observes and construes both reality and non-reality, and this yields many more options than a mere report would allow. Construal is most often effected by means of differential profiling of event-objects. In addition, it is possible for conflicts between inherent and contextual values to extend the range of use of a category via coercion.

3.1. Tense: present as immediate vs. past as distal

Both the present and the past tense can be used to refer to event-objects that do not belong to the corresponding times. This is generally the result of construal or of coercion presenting a conflict between the tense and the context. Of course different languages conventionalize different construals of the timeline.

The present tense can be used to report event-objects that are associated with past, present, and future times. The historical present is a device that maps past event-objects to the present so that they can be metaphorically re-experienced as if they were immediate as in (9a). Langacker (2008: 303) attributes the use of the present tense in a statement lacking any real time reference like (9b) or to express a proximate future like (9c) to the fact that the speaker is reporting on things that are relevant for immediate reality. The proximate future is primarily used to describe event-objects that are scheduled to occur, so even though they are in the future, they are available to the speaker at the present. Gnomic statements about the inherent nature of the world are likewise available to the speaker at present, and can thus be reported as such. In both cases, the event-objects are construed as part of present experience.

- (9) a. *Yesterday I met Sam. He says to me: What's up? I say: Not much. Then we go to lunch at our usual restaurant ...*
 b. *The earth revolves around the sun.*
 c. *We're flying home tomorrow.*

The past tense is also often found to have the capacity to express event-objects that did not take place in the past. Usually the result involves some kind of modal interpretation. In the case of (10a), *knew* does not refer to a past event-object, but rather to a hypothetical situation removed from immediate reality (Langacker 2008: 303). A similar effect is found in Dutch in (10b) (Janssen 1994: 122). The speaker exerts a modal force in both English (10c) and Russian (10d), trying to bring about a situation in the (near) future.

- (10) a. *If I knew her, I would go and talk to her right away.* English
 b. *Nou, maar ik vertrok morgen!* Dutch
 Well but I left tomorrow
 ‘Well, but I was supposed to leave tomorrow!’
 c. *It’s high time we left.* English
 d. *Pošli!* Russian
 Left-PAST-PLURAL
 ‘Let’s go!’

Janssen (2002) invokes the deixis of demonstratives to account for these extensions of the present and past tenses. According to his analysis, the present tense signals ‘THIS-context’, which can include anything that the speaker has immediate access to. By contrast, the past tense signals ‘THAT-context’, which is more distal, making it amenable to interpretation as hypothetical, counterfactual, or even future.

3.2. Aspect

The standard baseline for aspectual distinctions are Vendler’s (1967) four categories of lexical aspect (further elaborated below):

- States: *be hot, love*
- Activities: *walk, play*
- Achievements: *realize, reach the summit*
- Accomplishments: *write a letter, drown*

These lexical categories have typically been understood to correspond to grammatical aspect in that imperfective refers to states and activities, whereas perfective refers to achievements and accomplishments. Various tests for these categories have been proposed (cf. Mourelatos 1981), invoking features such as dynamicity, punctuality, and boundedness. However, neither the tests nor the categories themselves have proved adequate, largely due to the effects of construal and coercion. Indeed, most verbs can be shown to have multiple possible construals. The range of possibilities has been explored in detail by Talmy (2000 v. II) and Croft (2012) and are represented here in brief.

Croft recognizes four types of states: transitory states, acquired permanent states, inherent permanent states, and point states. A given state can be distinguished according to whether it presupposes a prior state (as in 11a–b), is irreversible (as in 11b–c), or is construed as a point (as in 11d).

- (11) a. transitory state *The door is open.*
 b. acquired permanent state *Princess Diana is dead.*
 c. inherent permanent state *Nicolas Sarkozy is French.*
 d. point state *It is five o’clock.*

Croft distinguishes two types of activities. Directed activities (cf. “gradient verbs” Talmy 2000 v. II: 68) like (12a) involve an incremental change, with continuous progress along

a scale. Undirected activities (cf. Talmy's "multiplex verbs") like (12b) do not involve an incremental change and can often be construed as a series of cycles, like ~~the taking of one step after another in~~ the case of *chant*.

- (12) a. directed activity *The soup cooled.*
 b. undirected activity *The girls chanted.*

Croft recognizes four types of achievements, plus a class of accomplishments. The first three types of achievements have the same contours as the corresponding states, differing only in profiling. Whereas the state is profiled for the former group, for the achievements, it is only the transition to the relevant state that is profiled. A reversible achievement (cf. Talmy's "one-way resettable") is (13a). An irreversible achievement (cf. Talmy's "one-way nonresettable") is (13b). Both reversible and irreversible achievements are directed changes, but a cyclic achievement (cf. Talmy's "full-cycle") like (13c), when interpreted to signal a single flash, is undirected. This is a common construal for verbs like *sneeze*, *wave*, *flash* which denote repeatable paired transitions between rest and action and the reverse. A runup achievement like (13d) includes an undirected activity (the presentation of various arguments which may or may not convince me), followed by a transition to the final phase (in which I believe Joe). The runup achievement type serves as a transition to accomplishments since it can also be understood as a nonincremental accomplishment, as opposed to a (neutral) accomplishment, which is incremental as in (13e).

- (13) a. reversible achievement *The door opened.*
 b. irreversible achievement *Princess Diana died.*
 c. cyclic achievement *The light flashed.*
 d. runup achievement *Joe convinced me he was right.*
 e. accomplishment *I wrote a letter.*

Croft observes that construal makes it possible for many verbs to have multiple aspectual interpretations. *Remember* signals a transitory state in (14a), but a directed achievement in (14b). Here different phases of the contour are profiled (the final state vs. the transition to it), and this can be understood as a metonymic relationship since different parts of the whole are selected. An utterance like (13c) can have different interpretations: if the light flashed once, it is a cyclic achievement; if it flashed for a while, it is an undirected activity. This is accounted for by Talmy's full-cycle vs. multiplex types. Croft invokes scalar adjustment for fine-grained (14c) vs. coarse-grained (14d) construals.

- (14) a. *I remember how to do this.*
 b. *I remembered the answer.*
 c. *The bridge is collapsing.*
 d. *The bridge collapsed at 9:15 am.*

Croft (2012: 91–92) suggests that a usage-based approach would ideally treat the issues of default vs. alternative construals as an empirical question and investigate the relative frequencies and factors involved rather than making a priori assumptions about which construals exist and which ones are prototypical.

In support of his categories Croft presents a comparative study of English Present, Progressive, and Past constructions with Japanese Present, *te-iru*, and Past constructions. A multi-dimensional scaling analysis of this data yields a circular continuum of verbs, with clusters that correspond to transitory states (*be ill, be president*), directed achievements (*split, die*), directed activities (*cover, shrink*), undirected activities (*dance, run*), cyclic achievements (*scratch, wave*), and inactive actions (*touch, stand*). Thus the behavior of verbs (in terms of the constructions they appear in) supports Croft's categories for lexical aspect.

While Croft claims that his revision of the Vendlerian categories is universally applicable, the most valuable contribution of his model may be at a more abstract level. The combination of profiling and construal gives us a highly nuanced model and the use of aspectual contours makes it possible to visualize different aspectual types. Specific revisions and additions may be necessary in order to accommodate the facts of a given language (see Janda forthcoming, concerning adjustments needed for Russian), but this is possible if we accept the model as a flexible complex of components rather than as a fixed set of options.

3.3. Mood: root, epistemic, and speech-act modality

Whereas modals in their root (deontic) use refer to obligation, compulsion, and permission and belong primarily to the psychosocial domain, many of the same elements can be used to express epistemic modality. Instead of exposing an event-object to modal force outside the realm of reality, an epistemic modal assesses the likelihood that an event-object belongs to reality. Epistemic modals thus belong to the domain of knowledge and reasoning. A root modal is focused on realizing an event-object, but an epistemic modal, instead of influencing the realization of the event-object, focuses on deciding whether the event-object is likely to be realized. In (15a), *may* represents a root use and influences the outcome of the event-object *leave*, making it more likely to occur. The same modal in (15b) represents an epistemic use: it has no influence on the likelihood of rain, but instead reports the speaker's attitude toward the probability it will rain (Langacker 2008: 304–307). In addition to root and epistemic use, we observe speech-act modality in sentences like (15c). Here the modal is focused on the domain of conversation: *may* removes a barrier to accepting a statement (that John is a rocket scientist). In other words, the import of the modal is: "I accept the assertion that John is a rocket scientist and should be smart, but ..." Here modality applies to the conversational interaction rather than to any effect on an event-object or its evaluation as likely (Sweetser 1990: 69–73).

- (15) a. root *You may leave now.*
 b. epistemic *It may rain this afternoon.*
 c. speech-act *John may be a rocket scientist, but he sure is dumb.*

There is some controversy over the relationship between the types of modality, particularly between root and epistemic modality (see overview in Mortelmans 2007). Given that these different uses of modals pertain to different domains (reality vs. nonreality,

reasoning, conversation), it is reasonable to interpret their relationship as a kind of mapping from the source domain of the root modals. It is not clear whether this mapping is metaphorical (Sweetser 1990) or metonymic (Bybee et al. 1994); additionally it has been suggested that epistemic uses result from increased subjectification (Traugott 1989). It is important to be aware that while Traugott and Langacker speak of subjectification and subjectivity in ways that may seem superficially similar, their notions differ; Mortelmans (2004) and Narrog (2012) explore these differences in detail. An alternative is to consider deontic and epistemic modality as equipollent components of modality rather than considering either one to be primary (Plungian 2011: 427). Narrog (2012) departs from the use of force dynamics and subjectivity in describing various types of modal expressions, relying instead on the parameters of speech-act orientation and volitivity. According to Narrog, modality refers primarily to a situation in which the factual status of a proposition is underdetermined.

4. Interactions of tense, aspect, and mood

In a previous overview article, Boogaart and Janssen (2007: 820–821) stated that it would be fruitful to explore interactions between the three categories of tense, aspect, and mood, but noted that such studies were sparse or lacking at the time. While there is still ample room for more research into such interactions, cognitive linguists have made considerable headway in filling this gap. Increasingly this involves empirical studies, usually of corpus data, to discover patterns of interaction. Most relevant studies focus on the interaction of only two of the categories, so the three logical pairings and recent studies pertaining to each are examined in turn.

4.1. Tense and aspect

Five

Four studies are cited here to represent the current state of research on how tense and aspect interact. Langacker gives an analysis of how tense and lexical aspect can conflict in English. Croft and Poole present a major typological study, shedding new light on earlier data. The remaining studies focus on corpus analysis of data for Slavic languages, which are famous for their Perfective vs. Imperfective verbs: Russian (Janda and Lya-shevskaya), Old Church Slavonic (Eckhoff and Janda), Croatian (Stanojević and Geld).

In an apparent paradox, Langacker (2011) asserts that despite the fact that the English Present cannot be used for present-time events, it does indicate coincidence with time of speaking. According to Langacker, an expression like (16a) is ungrammatical if used to express an ongoing action due a conflict between tense and aspect in English.

- (16) a. **He mows the lawn.*
 b. *I order you to leave.*

If one presumes that English has a distinction between perfectives like *mow the lawn* vs. imperfectives like *know Italian*, one can state this restriction as a rule: English does not (usually) allow the use of the Present tense with perfectives. The conflict arises

because in order to identify a perfective, one must observe the entire event-object, and usually this is not possible in the present, since a bounded event-object (a perfective) usually lasts longer than the present moment. Performatives like (16b) are a notable exception to this rule since they appear in the unusual situation in which a bounded event-object (ordering someone to leave) precisely coincides with the present moment (the utterance of the order). The performatives are the exceptions that prove the rule and solve the paradox, along with uses of the English Present for the historical present and proximate future with scheduled events (see 3.1 above): all of these represent event-objects that are available in their entirety at the present moment.

Croft and Poole (2008; see also Croft 2012) undertake a multi-dimensional scaling analysis for Dahl's (1985) data on the coding of tense-aspect markers in 250 contexts across 64 languages. The result is a two-dimensional map showing how various tense-aspect markers cluster; in other words, what kinds of groupings are attested cross-linguistically. The findings confirm the traditional division between tense and aspect, which emerge as perpendicular axes in the map. There is a central cluster consisting of hypothetical and gnomic situations as opposed to another cluster lying toward the future end of the continuum representing planned or expected future events. The separation between these two clusters is located in the future dimension, precisely where Langacker would predict an interaction between tense and mood (see 2.3 above). In terms of Croft's categories for lexical aspect, the contexts that fall on the imperfective end of the aspectual axis are all states or activities, but whereas the majority of contexts on the perfective end are achievements, we also find accomplishments, semelfactives, and even some activities and states. Although this result is not clear-cut, we acknowledge that construal can package activity and state verbs as bounded and therefore perfective event-objects (see 3.2 above).

Janda and Lyashevskaya (2011) present a corpus study of Russian verb forms across four subparadigms: Non-past, Past, Infinitive, and Imperative. The difference in distribution of these forms for Perfective vs. Imperfective verbs is statistically significant with a robust effect size. Furthermore, the difference in distribution between Perfective and Imperfective is the same regardless of whether it is marked by prefixes or suffixes, which shows that the aspectual categories have a consistent grammatical identity at a more abstract level. Janda and Lyashevskaya explore the verbs that are most attracted to various tense and aspect combinations. Despite the fact that grammars of Russian ascribe durative ongoing processes or repeated processes to the Imperfective Non-past, the verbs it attracts most all refer to gnomic event-objects, such as *javljaetsja* 'be' as in (17a). Perfective Non-past is associated in grammars with unique event-objects expected to be completed in the future. This study indeed finds verbs that signal promises (*upravitsja* 'will manage'), threats (*razterzaet* 'will tear to pieces'), and predictions (*vyzdoroveet* 'will get well'), but also performatives (*procitiruju* 'I quote'), and fixed expressions like (17b). Only among Imperfectives do we find verbs that are strongly attracted to the Past tense (the distribution for Perfective verbs is very wide), and these are associated with evidentials (*slyxal* 'heard'), habituals (*proxaživalsja* 'went for strolls'), and the narration of observations (*belel* 'showed white').

- (17) a. *Koška javljaetsja mlekopitajuščim.*
 Cat-NOM is-3Sg-NONPAST mammal-INST
 'A cat is a mammal'

- b. *vragu ne poželaes'*
 enemy-DAT not wish-2Sg-NONPAST
 'I wouldn't wish it on my worst enemy'

Ever since Dostál (1954) published his inventory of the aspectual types of Old Church Slavonic verbs, there has been controversy over whether the Perfective vs. Imperfective distinction was already in effect at that early stage of Slavic history. Eckhoff and Janda (2014) use corpus data to run a study similar to Janda and Lyashevskaya, but in reverse: with the distribution of verb forms as input, two different statistical models (correspondence analysis and divisive-clustering) test the structure of the data. The models do indeed separate the data according to aspect, with results that concur with Dostál's designations for 97% of verbs. Remarkably, while the first dimension that emerges from the correspondence analysis clearly aligns with Perfective vs. Imperfective aspect, the second dimension aligns with tense, yielding perpendicular aspect and tense axes similar to those found by Croft and Poole.

Stanojević and Geld (2011) examine the Croatian Aorist on the basis of both corpus and experimental data. The Croatian Aorist is a past tense formed only from Perfective verbs. Although standard grammars of Croatian state that the primary use of the Aorist is to mark past and often sequenced events, Stanojević and Geld observe that the Aorist is often used to signal recent past events with current relevance, as well as future events that are conceived of as (nearly) certain, as in (18a–b). Furthermore, as in these examples, the Aorist occurs predominantly in the first person singular form. As a Perfective form, the Aorist excludes the Present tense because it must view the event-object in its totality (cf. Langacker's analysis of the English Present above). Stanojević and Geld argue that the Aorist is epistemically immediate (as opposed to the Perfect which is epistemically distant), and this explains its reference to both immediate past and immediate future, as well as its association with the subjective experience of the speaker (first person).

- (18) a. *Ljudi, pogiboh!*
 People-NOM died-1Sg-AORIST
 'People, I'm dying!' (a call for help)
- b. *odoh i ja sutra ...*
 left-1Sg-AORIST and I-NOM tomorrow
 'although I am leaving tomorrow ...'

4.2. Tense and mood

In the future, tense and mood overlap, since future events are necessarily beyond the established realm of reality (see 2.3 above). Additionally, Langacker (2008: 300–302) observes that the tensed forms of English modal verbs serve to indicate epistemic rather than temporal distance. For example, Present tense *can* refers to a potential in relation to reality, whereas Past tense *could* is usually interpreted not as potential, but counterfactual and thus even farther removed from reality. Patard (2011) takes a similar approach to the English Past and French Imperfect, and asserts that both express modality in

utterances like (19a–b). In both types of examples, the past tense serves to mark epistemic distance, making such statements counterfactual.

- (19) a. *If only I was rich.* English
 b. *Si j'étais riche.* French

4.3. Aspect and mood

There appears to be an association between aspect and modality in examples like (20a–b). Whereas the perfective in (20a) facilitates a deontic reading, exerting a force on the event-object itself, the imperfective in (20b) facilitates an epistemic reading, expressing an assessment of the likelihood that John is reading the book. Boogaart and Trnavac (2011) examine this connection across Germanic, Romance, and Slavic languages. They conclude that the motivation for this association is given by a more general connection between imperfective aspect and subjective information, however it seems that this option is exploited only in Germanic and Romance, but not in Slavic languages.

- (20) a. *John must read that book.*
 b. *John must be reading that book.*

Russian lacks modal verbs (the only possible candidate being *moč'* 'be able'), but uses constructions containing modal words like *nado* 'have to' and *nel'zja* 'not allowed to' with Infinitives instead. In a quantitative study, Divjak (2009) showed that in such constructions Imperfectives are preferred to refer to generic obligations and possibilities, whereas Perfectives are preferred for specific event-objects. Janda and Lyashevskaya's (2011) results conformed with those in Divjak's study. In addition to aspect and tense (see 4.1), Janda and Lyashevskaya explore Russian verbs strongly attracted to Imperatives and Infinitives. In the Imperative mood it has traditionally been asserted that Imperfectives mark polite uses (21a) as opposed to Perfectives which mark rude uses (21b). However, Imperfective Imperatives are also associated with insistence (which can be rude), and there are many contexts in which a Perfective Imperative is neutral or polite.

- (21) a. Imperfective *Sadites'*
 Sit-2PI-IMPERATIVE
 'Please sit down'
 b. Perfective *Sjad'te*
 Sit-2PI-IMPERATIVE
 'Sit!'

Šatunovskij (2009) suggests that the difference in aspect has to do with whether the hearer understands what is expected. If the hearer does understand what to do, the Imperfective is preferred (probably because it is gentler, like a fluid substance, cf. 2.2 above), whereas if the hearer needs to receive instructions, the Perfective is preferred (since the hearer needs access to the entire event-object that is expected). Note that Šatunovskij's model accounts for the complexity observed since in a polite situation usually the hearer

knows what to do, and the Imperative just acknowledges when the action is to take place, but if the hearer is expected to do something and hesitates, the Imperative can express the speaker's frustration when the hearer fails when s/he should know better. Janda and Lyashevskaya's data confirm Šatunovskij's model, but also turn up some outliers that cannot be motivated, such as Imperfective requests for assistance (*vyručajte* 'help') and kind wishes (*vyzdoravlivajte* 'get well').

5. Conclusion

Despite a diversity of specific topics and languages, recent research on tense, aspect, and mood from a cognitive perspective presents a coherent story. Events are understood linguistically as objects and evaluated according to their location, properties, and relationship to reality or probability. Tense, aspect, and mood are confirmed both inductively and empirically as intersecting axes. All three grammatical categories can be manipulated to express speaker's construal, extending their scope beyond what would be needed to report on the objective reality of time. These three categories overlap and interact with each other in ways that we are only beginning to understand. In recent years, cognitive linguists have increasingly applied corpus-based empirical approaches to the study of these verbal categories. Future usage-based studies will hopefully expand our knowledge about the uses and patterns of tense, aspect, and mood both within given languages and cross-linguistically.

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31. Grammaticalization

1. Introduction
2. Grammaticalization – 100 years and more
3. Cognition in grammaticalization theory
4. Grammaticalization in cognitive linguistic theory
5. Conclusion
6. References

1. Introduction

This chapter first provides a brief historical perspective on grammaticalization, in section 2: it gives a general definition of the process, examines the origin of both the term and the idea and describes how it rose to prominence in the 80s and has been problematized more and more since the late 90s. Some of the reasons for this recent development are raised in the next two sections, which look at the link between grammaticalization and cognitive linguistics from two different angles. Section 3, on the one hand, discusses what cognition – in the broadest sense of the word – there is in current grammaticalization work. The following issues in particular are addressed, though they are not necessarily unique to grammaticalization: language acquisition as the locus of change; grammatical innovation as the result of the principles of clarity and economy, the desire to be expressive or the ubiquitous variation in the construal of situations; the effects of frequency in grammaticalization and their cognitive basis; the role of reanalysis versus analogy; and, finally, the mechanisms underlying the semantic changes in grammaticalization. Section 4, on the other hand, looks at what grammaticalization there is in current cognitive approaches to grammar. The focus is on Construction Grammar and Cognitive Grammar, two theories whose original orientation was predominantly synchronic. It is discussed how the former's notion of (grammatical) constructionalization involves a drastic widening of the scope of investigation as compared to the linguistic phenomena traditionally subsumed under grammaticalization and how subjectification is central to the grammaticalization work within the latter framework. Section 5 is the conclusion.