



EDITED BY

ROBERT I.

BINNICK

Oxford Handbook of
INSE AND ASPECT

THE OXFORD HANDBOOK OF

**TENSE AND
ASPECT**

EDITED BY

ROBERT I. BINNICK

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PREFACE

The goal of this volume is to represent what we know about tense and aspect early in the second decade of the twenty-first century.

To this end, I invited to contribute to the volume leading scholars residing in a dozen countries—Australia, Canada, France, Germany, Italy, Kenya, the Netherlands, Norway, Switzerland, Taiwan, the United Kingdom, and the United States—working in a wide range of areas (including most sub-fields of linguistics, from computational linguistics to stylistics), and representing a broad spectrum of approaches and schools of thought, from early twentieth-century-style descriptivism and structuralism to Relevance Theory, Role and Reference Grammar, Segmented Discourse Representation Theory, and other current paradigms.

I provided each with a title and charged them only with producing a chapter that represented what they would expect to find under that title in a volume called *The Oxford Handbook of Tense and Aspect*. Within that limitation, and on the assumption that each of them had far more expertise in their topic area than I did, I gave them total freedom.

The results are remarkably diverse—both broad surveys and deep analyses—and some chapters present quite novel results and/or argumentation. In some cases, conflicting chapters represent live controversies in the field, as the introduction indicates.

Though every effort has been made to present a comprehensive picture of tense and aspect, no one could hope to encapsulate the entire subject in thirty-six chapters, and gaps remain in the range of topics covered, approaches followed, and types of languages described. I would have liked to have included a chapter on the semantics of tense and aspect; on what Bernard Comrie called pure relative tense; and on the future tense and related futurate constructions. I would also have liked to have complemented the present chapter on resultatives with one on quite another type, e.g., *the chair is broken, the broken chair*, discussed in the chapters by Desclés and Guentchéva (§4.5), Ritz (§2.1), and Vulchanova (§3.1). It might likewise have been useful to have included chapters on contrastive and comparative studies, cognitive linguistic approaches, the sociolinguistics of tense and aspect, and mood and modality as they relate formally and functionally to tense and aspect. There are numerous other directions in which the present book could have been expanded as well. For example, there might have been chapters on individual tenses (past, present, etc.), in parallel to those here on specific grammatical aspects.

The introduction is intended to provide contexts for the disparate chapters, and the index should serve to point those interested in particular language areas or in topics not assigned their own chapter (e.g., mood, the past tense, signed languages,

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CHAPTER 5

MORPHOLOGY

ASHWINI DEO

1. INTRODUCTION

Natural language sentences employ a variety of devices to encode information about the temporal properties of the situations they describe. These include grammaticalized markers of location in time (tense) or temporal structure (aspect), temporal adverbials of location (e.g., *last year, now*) or frequency (e.g., *always, rarely*), lexicalized descriptions of events and their temporal structures (*Aktionsart* or lexical aspect), and discourse principles, which relate the ordering of discourse to the temporal order of events. Tense and aspect markers have been the most well-studied and long-studied devices among these, mainly because of their close association with what are traditionally known as the inflectional paradigms of verbs.¹

When taking a morphology-centered perspective on tense and aspect, three central questions present themselves: (a) What is the encoded meaning?, (b) In what form is this meaning encoded?, and (c) how are systems of encodings organized within a language? Scholars working within different traditions have addressed one or more of these three questions in various ways. In this chapter, I focus on how this research has contributed toward building a morphologically grounded cross-linguistic theory of tense and aspect.

The terms tense and aspect are used in at least two distinct ways in typological and semantic literature. As *morphological categories*, they refer to grammaticalized, obligatorily encoded distinctions that express temporal properties of situations. As abstract *semantic categories*, they refer to temporal properties that may or may not have a morphological reflex in a given language. The semantic categories are universal in that they are implicated in both the grammar and the discourse of many languages and also find robust morphosyntactic expression in

several unrelated languages. Language-specific tense-aspect systems reflect the negotiation between the morphological categories instantiated in the language and the range of (presumably universally shared) semantic notions expressible in that language. Studying this interplay between morphology and semantics has provided significant insights about the structuring of temporal information in grammar.

Before proceeding, it must be noted that the realization of tense and aspectual information within the verbal complex is not a neatly packageable matter of "morphology" and "syntax." Formal modifications like affixes and stem alternations often come together with periphrastic entities like participle-auxiliary combinations and locative constructions in creating the totality of temporal contrasts within a single language. Moreover, it has been observed that periphrastic constructions exhibit a diachronic tendency to evolve into inflected forms by processes of grammaticalization. Given that tense/aspect categories may be realized by varying formal devices, I prefer to interpret "morphology" broadly, as an examination of the structure and content of all grammaticalized tense/aspect marking in languages, rather than restricting myself only to the word-formation processes attested in this semantic domain.

This chapter is organized as follows: §2 lays out the essential components of a morphologically grounded theory of tense and aspect. §3 and §4 are concerned with the key meanings in the tense/aspect domain and their formal expression. §5 describes empirical generalizations about the ordering of tense/aspect markers in languages locating their source in semantic scope relations and diachronic change. §6 discusses the correlation between categorial form (inflectional vs. periphrastic) and categorial meaning observed in languages and its implications. §7 illustrates morphological and semantic blocking as they figure in analyses of tense/aspect systems. §8 concludes.

2. TEMPORAL MEANING AND ITS ENCODING

Reference grammars of languages abound in descriptions of morphemes and constructions that indicate pastness, ongoingness, futurity, anteriority, completedness, durativity, iterativity, habituality, inchoativity, and so on. The lists can be formidably long and the labels used, though tantalizingly similar across grammars, may not always converge perfectly on discrete, invariant units of meaning.² Moreover, the encoding of temporal information as obligatory (rather than optional) and grammatical (rather than lexical) is a language-specific choice. That is, not all languages grammaticalize the same kinds of meaning. Languages with no formal marking of tense distinctions, which have emerged as an important object of research especially in the past decade are a striking example of this formal variability (Yucatec Maya: Bohnemeyer, 2002; Kalaallisut: Bittner, 2007; Sł'at'imcets: Matthewson, 2006). Not only do the formal tense/aspect marking

devices available to individual languages vary, but also the systems of temporal contrasts realized by the totality of such devices within a given language. For instance, some languages may formally contrast a general marker of the imperfective aspect with a more specific progressive aspect marker (e.g., Romance, Hindi, or Turkish), while in other languages, aspectually neutral tense marking may coexist with distinct markers of progressive aspect and habituality (e.g., English).

This does not mean that there are no morphological or morphosemantic generalizations to be made crosslinguistically in the tense/aspect domain. On the contrary, as Bybee and Dahl (1989) observe, there is growing evidence for similarities, which suggests that "there may be some way of arriving at a crosslinguistic understanding of grammatical meaning, or more ambitiously, a universally valid theory of grammatical meaning" (Bybee and Dahl, 1989, p. 53). I believe that three components are essential to such a theory.

First, there must be a set of hypotheses about the semantic ingredients underlying tense/aspect categories.

Second, we need to determine the nature and organization of the temporal/aspectual pie and how it may be cut (or constructed) across languages.

Third, the theory must take into consideration the role of defaults and blocking mechanisms in the structuring of tense/aspect systems.

Semantic theory, since its inception, and especially with the growing interest in crosslinguistic semantics in the past decade, has developed several insights about the meanings associated with tense/aspect categories—the first component. The typological and grammaticalization literature (on which cf. the chapters by Desclés and Guentchéva, and Nicolle, in this volume) has uncovered a number of robust generalizations about the patterning of form and meaning in tense/aspect categories across languages. These generalizations have taken the form of implicational universals such as (1a), statistical tendencies such as (1b), and unidirectional diachronic trajectories such as (1c).

- (1) a. If a language has inflectional tense or aspect, it realizes past tense or perfective aspect or both.
 b. The progressive tends to be realized by periphrastic rather than inflectional means.
 c. RESULTATIVE » PERFECT » PERFECTIVE/PAST

These kinds of observations offer clues to the organization of the temporal/aspectual space (or pie) whose parts morphological forms map on to—the second component. Finally, the distribution of a tense/aspect marker depends not only on its semantic value but also on what else is available in the language and how it is realized. Studies of default interpretations in the temporal domain as well as morphological and semantic blocking provide a window into the division of labor between semantic value and formal expression in the tense/aspect domain.

A simultaneous investigation into the properties of encoded meaning and the properties of the encoding itself in the context of the larger system is thus at the heart of a morphologically grounded theory of tense and aspect.

3. TENSE AND ITS EXPRESSION

Tense, on the established view, is a deictic category that expresses a temporal relation between the (time of the) situation described by a sentence and some deictic center, most often the speech time. Language-specific tense expressions are grammaticalized markers that facilitate the location of situations in time with respect to the deictic center.

Tense markers may occur on the verb (as affixes or stem alternations) or as grammatical words in the verbal complex (auxiliaries or particles). The English Past (2a) and the accented augment in Vedic (2b) exemplifies the first type of morphological marking. In Wambaya (2c), on the other hand, verbs are unmarked for temporality (or any other category); tense information is located on the auxiliary, which occurs in the second position of the clause. As past tense markers, the function of each of these devices is to locate the time of the described situation before the speech time.

- (2) a. John **cooked/ate** pancakes for breakfast.

b. <i>á-han</i>	<i>áhi-m</i>	<i>ánu apás</i>	<i>tatard-a</i>	<i>prá vákṣaṇā</i>
kill-IMPACT.3.SG	dragon-ACC.SG up	water-ACC.PL	open-PPCT.3.SG	forth rushing
<i>a-bhina-t</i>	<i>párvatā-nām</i>			
cut-IMPACT.3.SG	mountain-GEN.PL			

"He slew the Dragon, then opened up the waters, and cut channels through the mountain torrents (rushing forth)." (RV 1.32.1c-d)³

c. <i>nganki</i>	<i>ngiy-a</i>	<i>lurrqbanyi</i>	<i>warrdangarringani</i>
this.SG.II.ERG	3.SG.FA-PST	grab(UNM)	MOON-ERG

"The moon grabbed her."⁴ (Nordlinger and Bresnan 1996)

There are two dimensions to temporal localization—*relative ordering* and *relative distance*. On the first dimension of relative ordering, there are three logically possible relations: A situation may be described as being located before speech time (past), overlapping (or simultaneous) with speech time (present), or following speech time (future). A perfectly transparent formal counterpart of this temporal classification would be a marking system with reasonably similar dedicated devices to indicate past, present, and future reference. For instance, tense markers might belong to the same formal class of marking, as is the case with tense marking suffixes in Lithuanian (Chung and Timberlake, 1985, pp. 204–205) and Malayalam (George, 1971, p. 43) or pre-verbal particles in Tongan (Ultan, 1978).

- (3) a. *dirb-au*
work-PST.1
"I worked/was working."
b. *dirb-u*
work-PRES.1
"I work/am working."
c. *dirb-siu*
work-FUT.1
"I will work/be working." (Lithuanian: Chung and Timberlake, 1985, pp. 204–205)

Such perfect form-meaning correspondences are rare in the inflectional paradigms of most languages. In several languages, there is no special marking corresponding to the present tense and unmarked verb forms are interpreted by default as having present reference. Based on her database study of fifty languages, Bybee (1985) reports that this is the case for at least some allomorph of the present tense in Basque, Garo, Georgian, Kutenai, Maasai, Nahuatl, Ojibwa, Sierra Miwok, Timucua, Tiwi, and Wappo. Yet another way in which languages deviate from the transparent three-way contrast for tense marking is via *binary* tense systems (Comrie, 1985) in which the conceptual tripartite division has been collapsed into a two-way formal contrast—a past–nonpast opposition or a future–nonfuture opposition. Examples of languages with a past–nonpast opposition include German, Finnish (Comrie, 1985, p. 51), and Kannada, illustrated in (4).

- (4) a. *avanu manege ho:d-a*
he home go-PST-3SG.M
"He went home."
b. *avanu manege ho:gu-tt-a:ne*
he home go-NONPST-3SG.M
"He goes home (habitually)." or "He will go home." (Kannada: Bhat, 1999, p. 17)

The rarity of perfectly symmetrical formal behavior of the three tenses is also connected to the metaphysical and epistemological asymmetry between the non-future and the future. Any talk about the future is inextricably tied to modality. While the past (and to some degree, the present) is factual and decided, any assertion about the future is accompanied with some degree of indeterminacy. Futurity has to do with plans, intentions, obligations, and predictions, notions that all have to do with mood and modality, and are inherently non-factual. Crosslinguistic surveys have revealed that forms that realize future time reference are often used atemporally and have functions associated with mood and modality, such as possibility or probability (e.g., Kiwai, Zapotec), intention (e.g., Garo, Zapotec, Pawnee), desire or volition (e.g., Goajiro, Quileute) (Ultan, 1978; Bybee, 1985; Dahl, 1985; Bybee et al., 1994).

Empirically, this raises the question of whether *any* marking that realizes future time reference is distinct from past and present marking in necessarily

conveying both temporal and modal meaning. The morphological repercussion of this difference would be the paradigmatic and formal independence of future marking from past and present tense marking, a hypothesis borne out by cross-linguistic data (Bybee, 1985, p. 157). Bybee reports that of her 50-language sample, seven languages have future inflectional marking, but not present or past tense inflection. On the other hand, of the eighteen languages that carry past/present inflection, only three lack an inflectional future.

The interaction between aspectual marking (imperfective/perfective), tense marking, and temporal reference must also be taken into consideration. Assuming the punctuality of speech time or the deictic center, any marking that encodes present tense meaning (i.e., overlap with the deictic center) is likely to correlate with imperfective aspect (excluding performative verbs and the sports commentary uses of present marking). Marking that encodes past tense meaning on the other hand allows both perfective and imperfective reference (e.g., the English past tense). Further, formal expression of aspectual distinctions is more common in the past tense, leading to what are called "tripartite" systems of temporal marking, such as those exhibited in the Romance languages. In such a system, the imperfective-perfective aspectual contrast is only expressed in the past tense with the present tense marking being uniformly imperfective.

Finally, research from a formal semantic perspective and crosslinguistic findings have clearly demonstrated that grammaticalized tense markers are not necessary components of a language's temporal marking system. Precise temporal reference is never impeded for lack of dedicated tense-marking devices and may be achieved in context via aspectual marking (e.g., Yucatec Maya: Bohnemeyer, 2002) or mood marking (e.g., Burmese and Dyirbal: Comrie, 1985, pp. 50–51).

Temporal location of events in languages that do grammaticalize tense may additionally involve the parameter of relative temporal distance from the deictic center. Such a system, also known as a remoteness marking system, exhibits a formal contrast between "close" and "remote" past tenses and/or "close" and "remote" future tenses (see the chapter by Botne, in this volume). Dahl and Velupillai (2005) report that 20% of the languages in their sample of 222 languages make these distinctions via formal means and that this feature is widely distributed genetically.⁵ A very robust generalization about remoteness marking systems is that they minimally distinguish between *hodiernality* where temporal distance is within the day of the speech event and *pre-hodiernality*, where the event referred to is not located within the day of the speech event. For instance, Kamba (Bantu) distinguishes between an immediate hodiernal past, a pre-hodiernal recent past, and a remote past tense (Whiteley and Muli, 1962) while Yagua (Peba-Yaguan) exhibits five degrees of remoteness in the past tense (Payne and Payne, 1990, pp. 386–388, cited in Dahl and Velupillai, 2005). Remoteness as a category may not be realized symmetrically in the past and the future tenses, and is less often instantiated in the future, perhaps an effect of the diachronic fact that recent/hodiernal pasts may evolve from forms expressing the perfect aspect (Dahl, 1985, p. 125; Dahl and Velupillai, 2005).

4. ASPECT AND ITS EXPRESSION

In this section, given the limited amount of space available, I will restrict my attention to the imperfective-perfective contrast, and the well-studied and robustly realized aspectual categories of the progressive and the perfect.

4.1. The Imperfective—Perfective Contrast

Aspect, following Comrie (1976, p. 3), is usually defined as describing "different ways of viewing the internal temporal constituency of a situation." This definition identifies the fundamental aspectual opposition between the perfective and the imperfective, often expressed via inflectional marking on the verb, a contrast which is intuitively said to distinguish between how situations are presented: from the outside vs. the inside, as completed or as ongoing, as atomic or as internally differentiated.

Rendille (East Kushiitic, Kenya) illustrates a prototypical example of the imperfective-perfective contrast. Modulo context, the verb form *chiirta* (5a) can be used to refer to events in progress and habits, both in the present and in the past. It can also be used for future reference. The perfective form *chiirte* (5a), is typically restricted to referring to single completed events in the past.

- (5) a. khadaabbe chiirta
 letter.PL write.IMPF
 "He writes letters."
 "He is writing letters. He wrote letters."
 "He was writing letters. He will write letters."
- b. khadaabbe chiirte
 letter.PL write.PFV
 "He wrote letters." (Dahl and Velupillai, 2005, p. 267)

This basic opposition in the distribution of two verbal inflectional forms is fairly stable across languages; some languages may also formalize distinctions within these categories. Inflectionally expressed grammatical aspect contrasts with lexical aspect (also called *Aktionsart* or situation aspect), which typically refers to the types of eventualities denoted by uninflected predicates (cf. the chapters by Filip and De Swart, this volume). To the extent that this chapter is about morphology, it is concerned with the morphological and semantic categories that are studied under the heading of grammatical aspect. However, the semantic notions that underpin grammatical aspect categories are intricately connected with (though not identical with) the semantic notions that underpin lexical aspect distinctions, justifying an engagement with both categories here.

It has been noticed at least since Aristotle that natural languages distinguish between two kinds of descriptions of situations: those that necessarily involve some end or limit (e.g., die, break) and those that do not (e.g., love, swim).⁶ This distinction,

best known as the distinction between telic and atelic predicates emerged in linguistic theory in the context of the classification of lexical and composite uninflected verbal predicates.⁷ Developing on work by Ryle (1949) and Garey (1957), Vendler (1957) defines four aspectual classes that are intended to capture "the most common time schemata implied by the use of English verbs" (Vendler, 1957, p. 144). These classes—states, activities, accomplishments, and achievements—are determined by the semantic criteria of durativity, change, homogeneity, and telicity.⁸ Of these, the atelic predicate types (states and activities) are characterized by homogeneity or the subinterval property (Bennett and Partee, 1978; Dowty, 1979). That is, whenever they are true of some temporal interval, they are also true at any part of that interval. Telic predicates (achievements and accomplishments) lack this property.⁹

The homogeneity-based telic/atelic distinction coexists in an uneasy relationship with the perfective/imperfective distinction in the realm of grammatical aspect (cf. the chapter by Gvozdanović, this volume). Central to the debate in this area is the issue of whether it is telicity or some other property that underlies the formally expressed contrast. On one end of the aspect spectrum, researchers sharply distinguish telicity, as a property attributable to predicates describing situations with an inherent telos or endpoint, from boundedness, which concerns the presence or absence of a temporal boundary (Declerck, 1979; Depraetere, 1995; Smith, 1997) and is the property relevant to the analysis of grammatical aspect marking. At the other end, grammatical aspect marking is taken to have the function of affecting or reflecting the telicity value of the predicate that they apply to (e.g., De Swart, 1998).

Binnick (2006, pp. 255–256) classifies theories of grammatical aspect meaning into three types based on how they derive the intuitions (completed vs. ongoing, etc.) about the effect of the imperfective and the perfective aspectual operators: Boundedness theories, Phasic theories, and Relational Aspect theories. Boundedness theories take aspectual operators to make reference to temporal boundaries or edges of eventualities. For instance, Smith (1997) defines the distinction between the imperfective and the perfective in terms of whether they include the initial and/or the final bounds of the eventuality described in the sentence. Relatedly, aspectual categories have been defined in terms of mereological notions like whole and part (e.g., Verkuyl, 1972; Krifka, 1986; Filip, 1999) or event-structural notions of culmination or completedness (e.g., Dowty, 1979; Parsons, 1990). In Phasic theories of aspect, aspectual operators are predicate modifiers that map eventuality predicates of a given aspectual class to their phases or sub-eventualities, which may be of a different aspectual class, thus directly manipulating the telicity of predicates in their scope (Mourelatos, 1978; Vlach, 1981; Kamp and Rohrer, 1983; Moens and Steedman, 1988; De Swart, 1998).

Finally, in Relational Aspect theories, aspectual categories are said to express relations between a salient reference time and the time of the eventuality (Reichenbach, 1947, and later work inspired by the Reichenbachian approach (notably Klein, 1994)).¹⁰ The idea underlying the Reichenbachian/Kleinian system is simple yet powerful. Tense/aspect expressions are exponents of ordering relations between three temporal parameters—speech time S (the time of utterance), event time E (the time at which the situation described in a sentence holds or occurs), and reference time R (the time which the sentential assertion is about).¹¹ While tense corresponds

to the relations between the speech time and reference time, aspect corresponds to relations between the event time and reference time. The space of ordering possibilities between these parameters yields the tense/aspect relations in (6). Grammaticalized markers of tense and aspect are assumed to correspond to these relations.

(6) Tense	Aspect
S < R (Future)	E < R (Perfect)
S > R (Past)	E > R (Prospective)
S ⊂ R (Present)	E ⊂ R (Perfective)
	R ⊂ E (Imperfective)

In the context of Relational Aspect theories, it is necessary to recall the distinction that Comrie (1976, 1985) makes between aspect proper and relative tense. For Comrie, aspect has to do with alternative ways of presenting situations and therefore relies on notions such as whole and part, completed and ongoing. Relative tense, on the other hand, has to do with temporal relations that hold between the time of a situation and some point of reference and is described via notions such as anteriority, simultaneity, and posteriority. Following this distinction, the perfect and the prospective aspects are treated as relative tenses rather than aspects. Relational Aspect theories collapse these two distinctions into a single time-relational category of grammatical aspect. Crucial to this unification is the treatment of the imperfective/perfective distinction in terms of the temporal relation of inclusion, as shown in (6).

Part of the reason for the multiplicity of approaches to aspectual meaning has been the formal constitution of the Slavic aspectual system, which has influenced much of the aspectological thinking during the twentieth century (Binnick, 1991; Klein, 1995; Filip, 1999). (Cf. the chapters by Andrews and Gvozdanović, this volume.) The relevance of this system (and also the reason for some confound) is its peculiar formal realization of the perfective-imperfective contrast via several prefixes that serve as telicizing eventuality modifiers in other languages. The facts are as follows: Apart from a few ambiguous verbs, uninflected verbs in Slavic can be assigned to either the imperfective or the perfective aspect. Morphologically simplex verbs are typically imperfective.¹² Adding a verbal prefix to a simplex verb results in the creation of a perfective verb form as is exemplified by the Russian forms in (7). The prefixation may be semantically empty, effecting only an aspectual shift (7a–b) or it may contribute determinate additional meaning such as inchoativity (7c) or more indeterminate meaning as in (7d).¹³

- (7) a. čitat' 'to read (IMPF)' → pro-čitat' 'read (PERF)'
 b. delat' 'to do (IMPF)' → s-delat' 'do (PERF)'
 c. ljubit' 'to love (IMPF)' → po-ljubit' 'to fall in love (PERF)'
 d. pisat' 'to write (IMPF)' → za-pisat' 'to write down' (PERF)'

The Slavic prefixes, similar to preverbal particles in other languages (e.g., the particle *auf* in *auftrinken* in German), started out as meaningful prepositional and adverbial elements, belonging to the derivational component of the language, generating new complex verbs with corresponding change in the lexical content. The semantic contribution of the prefix results in a telic predicate (Krifka, 1992; Filip, 2000). In the modern languages, many of these prefixes are semantically empty, adding only an aspectual meaning, resulting in minimal pairs that are distinguishable

only in their aspectual value ((7a–b) above). For a more detailed overview of the full diachronic development and description of the Slavic aspectual system, see Forsyth (1970), Comrie (1976), Binnick (1991, pp. 135–139) and the references therein.¹⁴

The theoretical literature on the Slavic aspectual system is divided between whether these preverbs contribute to a modification of the type of situation expressed by the verb (e.g., Filip, 2000; Paslawska and von Stechow, 2001), or whether they contribute viewpoint aspect (e.g., Klein, 1995; Smith, 1997; Borik, 2002). Morphologically, the Slavic prefixes behave like derivational rather than inflectional morphemes. The semantic contribution of the prefixes is variable and the result of the morphological operation is a new derived verb that inflects for past or non-past tense.¹⁵ In addition, perfective verbs may be further imperfectivized via a morphological process of affixation, a suffix *-va* (with allomorphs *-iva* and *-yva*). This availability of secondary imperfectivization also suggests that the perfectivizing prefixes in Slavic are more appropriately analyzed as eventuality modifiers rather than time-relational operators à la Klein (1994, 1995). Filip (2000) makes a convincing claim for this approach.

In contrast to Slavic and other prefixing aspectual systems (Comrie, 1976, pp. 93–94), many languages realize the imperfective-perfective aspectual contrast via inflectional means (as illustrated in (5)). Bybee (1985, pp. 36–37) also notes that aspectual expression is much more likely to correlate with stem alternations than any other inflectional category. In fact, the imperfective-perfective contrast is one of the most commonly realized contrasts in the world's languages and is expressed consistently by bound morphology rather than by periphrastic devices (Bybee and Dahl, 1989, p. 83; Dahl and Velupillai, 2005). Examples include Greek, Romance, Indo-Aryan (Indo-European), Arabic (Semitic: Ryding, 2005), Bambara (Mande: Tröbs, 2004). In such languages, sentences describing events in progress at a given reference time and habits, states, generalizations, or dispositions that hold at reference time, all contain verb forms with uniform inflectional marking (modulo allomorphy). Perfective marking describes situations as completed at reference time and is most often used to refer to single, atomic events.

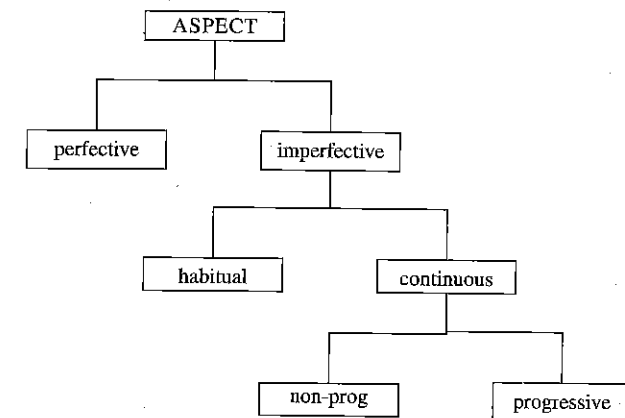
Unlike with Slavic, these distributional patterns of aspectual morphology are best formalized via Relational Aspect-based theories where the imperfective and the perfective express the relations of temporal inclusion, $R \subset E$ and $E \subset R$ respectively (from (6)). That is, imperfective marking yields those times that are properly included within the time at which some eventuality of type *P* holds, whereas perfective marking yields those times that include the time within which some eventuality of type *P* holds.¹⁶ This treatment has the advantage of guaranteeing (without stipulation) the observed homogeneity of imperfective-marked sentences and the non-homogeneity of perfective-marked sentences (Kamp and Rohrer, 1983; Partee, 1984; Hinrichs, 1985; Dowty, 1986; De Swart, 1998).¹⁷

4.2. The Progressive and the Perfect

Beyond the imperfective-perfective opposition, the aspectual landscape consists of widely attested categories such as progressive, perfect, prospective, and habitual marking. (In this volume, cf. Mair on the progressive; Ritz on the perfect; and Carlson,

and Bertinetto and Lenci, on the habitual.) I limit my attention to the first two of these categories.

The progressive: The progressive is most commonly treated as a subcategory of the imperfective aspect, restricted to descriptions of ongoing events. Consider the representation of aspectual space from Comrie (1976) in (8), which shows that imperfective meaning encompasses habitual (including the generic/dispositional meaning), progressive, and non-progressive continuous meaning. The “continuous” category subsumes lexically stative predicates such as *love*, *know* (which correspond to non-progressive meaning) and progressive meaning. Each of these subcategories may be realized by distinct formal devices or languages may use a single form to express imperfectivity. Bybee et al. (1994) report that while languages do encode the habitual/generic meaning and progressive meaning via specific forms, there is no parallel evidence for the encoding of the subcategory “continuous.”¹⁸



Languages which instantiate a distinct progressive form typically use it to refer to events in progress at reference time.¹⁹ There is a rich research tradition on the meaning of the progressive aspect engendered primarily by the investigation of the English Progressive (Dowty, 1979; Vlach, 1981; Landman, 1992; Portner, 1998, among others). Typological studies indicate that the encoding of progressive meaning in a language is independent of whether the language encodes imperfective aspect. That is, languages may vary within a four-way typology—whether they morphologically realize the imperfective or the progressive or neither or both. The following table gives examples of languages that fall in each of these slots.

(9)

ASPECT		Languages
IMPF	PROG	
∅	∅	German
∅	✓	English
✓	∅	Arabic
✓	✓	Hindi, Italian

In contrast to the general imperfective, the progressive is often realized via periphrastic marking (more discussion in §6). The English Progressive construction (*be*

V+ing) with tense marking on the auxiliary, exemplifies this pattern.²⁰ Moreover, it has been noticed that progressive marking in languages often involves periphrasis that builds up on the imperfective marking within the same language in conjunction with locative markers or tense auxiliaries. The presence of locative elements in progressive marking has been observed to be a worldwide tendency by Bybee et al. (1994), generalizing from earlier work by Blansitt (1975), Traugott (1978), and others. Consider the examples from Godié, a language of the Kru family (Marchese, 1979, p. 108), where the progressive aspect is realized as a locative construction with a place marker, based on the imperfective form of the verb.

- (10) a. σ *kə* *suká* *ɓi* *dá*
 she PROG rice pound-IMPF PLACE
 "She is pounding rice."
 b. σ *suká* *ɓi*
 she rice pound
 "She is pounding rice."

The Middle Hindi progressive is similarly built up on the finite imperfective form in combination with present and past tense auxiliaries (Kellogg, 1893; Deo, in progress). The form affixed with *-ta* is the general tenseless imperfective form in the language. The use of past and present tense auxiliaries in periphrasis with the imperfective form allows reference to events in progress.²¹

- (11) a. *saba* *santa* *sukhi* *vicara-ta* *mahi*
 all saint.NOM.PL contentedly walk-IMPF.M earth
 "All saints live (lit. walk about) contentedly on earth."
 (Text: Tulsi Ramayana, cited in Kellogg, 1893, p. 318)
 b. *mānah-ū* *mori* *kara-ta* *hahī* *nindā*
 think-SUBJ.1.SG my do-IMPF.M PRES-3.PL censure.NOM
 "I feel as if they are rebuking me." (Text: Tulsi Ramayana 3. 36)

The perfect: The status of the perfect as a monolithic primitive semantic category has been subject to some debate given the variation observable in the distribution and uses of forms labeled "perfect" across languages (Dahl, 1985; Bybee et al., 1994; De Swart and Molendijk, 2001; Iatridou et al., 2001). Comrie (1976) identifies four distinct readings of the perfect (12) all of which are exhibited by the English periphrastic perfect construction (*have V-en*).²² Each of these readings minimally involves temporal anteriority or relative pastness of the eventuality described in the sentence with respect to some reference time.

- (12) a. Perfect of result: *I have broken my glasses (and so I can't read now).*
 b. Experiential (or existential) perfect: *I have visited Paris once.*
 c. Universal perfect of perfect of persistent situation: *I have lived in Paris all my life.*
 d. Perfect of recent past: *President Obama has left Mumbai for New Delhi.*

Although these readings may co-occur in the same morphological formation, it is often the case that language-specific perfect markers exhibit only a subset of these

readings. One of the important challenges for theories about the meaning of the perfect is to identify the nature of the anteriority expressed by perfect morphology and to derive its various readings from the basic meaning together with its interaction with the lexical aspect of the event description it combines with and pragmatic factors.²³ The anteriority component, an essential part of any semantic theory of the perfect, is overwhelmingly encoded via forms that signal completedness (resultative participles, past participles, or perfective forms).²⁴ The combination of these participles with tense auxiliaries gives the perfect its morphologically composite character. Given that the perfect is a complex construction built out of multiple morphosyntactic pieces, a compositional analysis of the perfect is concerned with how the meanings encoded in each piece combine to yield the meaning associated with the construction as a whole.

The perfect may also be realized inflectionally rather than periphrastically as is the case for the older Indo-European languages, Greek and Sanskrit. The Perfect paradigm in Vedic is formed with a special reduplicated stem and a special set of person-number endings.²⁵ A notable point about the Indo-European Perfect is its stative present reading. For instance, in Vedic Sanskrit, with a small class of verbs, the perfect inflection is interpreted as denoting an ongoing state (13). In fact, the stative use has been argued to be diachronically the earliest function of the Indo-European Perfect (Renou, 1925).

- (13) Root Perfect Interpretation
 a. *vid* 'know' *veda* 'knows' (has come to know)
 b. *cit* 'think' *ciketa* 'knows' (has come to know)
 c. *bhi* 'fear' *bibhāya* 'fears' (has become frightened)
 d. *juṣ* 'rejoice' *jujoṣa* 'rejoices' (has rejoiced)
 e. *dhā* 'hold' *dadhāra* 'holds' (has held)
 f. *sthā* 'stand' *taṣṭhau* 'stands' (has stood)

The stative uses of perfect morphology bears some resemblance with resultative participial constructions found in other languages, which assert the existence at reference time of a target state lexically associated with the verb. A stative construction such as *the horse is yoked* asserts that the horse is in a state of being yoked at utterance time.²⁶ Such result-stative constructions are distinguishable from the perfect in being typically restricted to change-of-state predicates and their compatibility with an adverbial like *still*. Bybee et al. (1994) observe that in several languages, these constructions evolve into more general markers of perfect marking. This has been the case for Romance (Squartini and Bertinetto, 2000), Germanic (Traugott, 1972), as well as Indo-Aryan (Condoravdi and Deo, 2008).

Finally, it has been observed that the aspectual properties of the participial form involved in the construction of the perfect plays a crucial role in determining the readings available to perfect markings in languages. Iatridou et al. (2001) argue that the availability of the universal perfect reading for the perfect has to do with whether the participle carries perfective or imperfective specification. For example, in Bulgarian, a perfect formed on the perfective participle of a stative verb exhibits only the existential reading (14a), while a perfect formed on the imperfective participial form of the same verb has the universal reading (14b).²⁷

- (14) a. *Marija e obiknala Ivan*
 Maria is love-PERF.PART Ivan
 "Maria has fallen in love with Ivan."
 b. *Marija vinagi e obižala Ivan*
 Maria always is love-IMPERF.PART Ivan
 "Maria has always loved Ivan." (Iatridou et al 2001, pp. 171–172)

5. FORM–MEANING CORRESPONDENCES

The relative scope of tense and aspect operators (15) is taken to be invariant in theories of the syntax-semantic interface. Aspectual operators alter the propositional content of the eventuality description they apply to. Tense operators, in contrast, locate the aspectually modified description in time with respect to the deictic center (most often the speech time).²⁸

- (15) [TENSE [ASPECT* [eventuality description]]]²⁹

When distinct elements of the morphosyntactic structure realize tense and aspect, we see this hierarchical structure reflected crosslinguistically in relative ordering tendencies (Bybee, 1985). Julien (2002), on the basis of an extensive survey of 530 languages, reports that aspect markers are always closer to the verbal stem than tense markers if both occur on the same side of the verb, with tense markers preceding aspect markers in all other cases. This tendency is exemplified by the Turkish (agglutinative aspect and tense), Hindi (affixal aspect) and Mauritan Creole (tense and aspect particles) cases in (16).

- (16) a. *genellikle iki saat çalış-ır-di-m*
 usually for two hours work-IMPF-PST-1SG
 "I would usually work for two hours." (Turkish: Göksel and Kerslake, 2005, p. 331).
 b. *nišā rasoī-mē roti banā-t-ī hai*
 N.NOM kitchen-LOC bread.NOM.SG make-IMPF-E.SG PRES.3.SG
 "Nišā makes bread in the kitchen." (Hindi: Deo, 2009)
 c. *lapli ti pe toñbe*
 rain PAST IMPF fall
 "Rain was falling." (Mauritan Creole: Adone, 1994, p. 44, cited in Julien, 2002).

A syntactic explanation for this pattern is Baker's (1985) Mirror Principle, which is the hypothesis that the order of morphemes in complex words reflects the natural syntactic embedding of the heads that correspond to those morphemes. Cinque (1999) has shown that the Mirror Principle holds in tense/aspect/mood inflectional morphology across a wide variety of languages. A closely related hypothesis is Bybee's (1985) semantic relevance claim that relates the affix-ordering tendency to

the nature of the semantic contribution of the affixes concerned. Bybee's idea is that aspectual affixes contribute more to changing the meaning of the lexical predicate and are therefore more "derivational" than tense affixes.³⁰

The crosslinguistic landscape, however, presents much more morphological complexity than the transparent mappings illustrated in (16). Portmanteau expression of tense and aspect meaning, as in the Romance Imperfect, or tense or aspect marking with mood, agreement, or voice marking have been attested in languages. For instance, in Arabic (McCarthy, 1981; Ryding, 2005) the vocalic infixes to the verbal root carry specification for *both* aspect and voice, rather than employing distinct devices for each category. Consider the stems for the root *ktb* 'read' in (17).³¹

- (17) Aspect Active Passive
 Perfective *katab kutib*
 Imperfective *aktub uktab*

Agreement markers may also form distinct paradigms across the tenses or the aspects so that the aspectual contrast is at least partially realized via agreement. The Indo-European Perfect has its own reduplicated stem and a special set of person/number endings that contrast with the agreement endings for the other aspectual categories of Indo-European—the Aorist and the Imperfect (Delbrück, 1876; Renou, 1925).

The stable facts of the relative ordering of tense/aspect information as well as the fusion of temporal marking with other verbal marking together point to an interaction between the semantic content of tense/aspect marking and the diachronic forces that are responsible for developments ultimately leading to complex word formation. It is an established fact that most inflectional morphology diachronically emerges from the recruitment of morphosyntactic and lexical resources of a language to create new categories (Meillet, 1912; Givón, 1979; Traugott and Heine, 1991; etc.). The grammaticalization and phonological reduction of syntactic material such as auxiliaries and adverbs across time is at least partially responsible for the ordering effects that are robustly seen in languages.

As an example of the fairly common pattern of auxiliary cliticization and affixation, consider the Bengali facts from Lahiri (2000, pp. 78–84). The Modern Colloquial Bengali Progressive originates in an Early Bengali periphrastic construction based on an imperfective participle and tense auxiliary (18a).³² In Middle Bengali (Chatterjee, 1926), the auxiliary phonologically reduces (loss of initial vowel) and encliticizes to the participle (18b), naturally respecting the generalization for relative tense/aspect ordering. In Colloquial Modern Bengali (18c), the original imperfective aspectual affix has been completely lost while the tense clitic has the status of an affix. The affricate /č/ of the auxiliary is synchronically interpreted as the marker of progressive aspect, while the original person/number affixes also contribute tense information. Aspectual marking, sourced from the tense auxiliary in a periphrastic construction thus diachronically emerges closer to the root than the peripheral person/number endings.

(18) Language stage	Form	Grammaticalization
a. Early Bengali	<i>boś-i āč-i</i> sit-IMPF be-PRES.1.SG	auxiliary
b. Pre-colloquial Bengali	<i>boś-i-či</i> sit-IMPF-PRES.2.SG	clitic
c. Colloquial Bengali	<i>boś-č-i</i> sit-PROG-PRES.2.SG	affix

Aspect-based split ergativity presents another sort of example where diachronic forces interact with semantic content to yield stable form-meaning correlations at a clausal level. Crosslinguistically it has been observed that ergative/absolutive case marking patterns are associated with perfective aspect (or its cognates) while nominative/accusative case marking is associated with imperfective aspect. Anderson (1977, 2004) has argued that this clause-level correspondence between verbal aspect and case is rooted in diachronic pathways of change rather than universal constraints associating subject marking with aspectual category. Split ergativity emerges through the reanalysis of passive and possessive constructions with oblique agents as perfective (Indo-Iranian), or object-demoting constructions with oblique patients as imperfective (Georgian). This sort of typologically robust formal correspondence is rooted more in diachronic tendencies rather than the nature of temporal meaning.

6. SYNTHESIS, PERIPHRAISIS, AND EVOLUTION OF MEANING

The bulk of work on morphological devices encoding tense and aspect has been carried out in the typological and grammaticalization tradition. The classic texts in this area remain Comrie (1976, 1985) and the typological surveys pioneered by Dahl (1985) and Bybee (1985), which were further developed in Bybee et al. (1994) and Dahl (2000). This research has uncovered a number of robust generalizations about the patterning of form and meaning in these domains:

1. There is a striking correlation between meanings of tense-aspect categories and their formal expression—bound, periphrastic, or unmarked.
2. The lexical resources harnessed in creating new tense/aspect morphology are sourced from a small set of semantic fields.
3. Morphological exponents of categories tend to diachronically evolve to express other categories.

From the synchronic perspective, the relative uniformity of the semantic categories that are realized periphrastically vs. synthetically across languages is quite

remarkable. (19) reports the tendency for periphrastic vs. synthetic realization for a set of commonly realized tense/aspect categories.

(19) Expression of major semantic categories in Dahl (1985)

Periphrastic		Bound	
perfect (16/18)	88%	past (33/45)	73%
		perfective (17/20)	85%
progressive (18/19)	95%	imperfective (7/7)	100%
future (27/50)	54%	future (23/50)	46%

(Bybee and Dahl, 1989, p. 56)

This non-accidental connection between categorial form and categorial meaning is understood to indicate that the progressive and the perfect tend to be relatively recent formations in languages in contrast to the other tense/aspect categories (given the independent word > clitic > affix trajectory in morphosyntactic form). Grammaticalization theory correlates the predominantly periphrastic expression of these categories with the nature of their meaning. Specifically, the progressive and the perfect express more specific meaning categories, whose generalized versions are the imperfective and the perfective or past respectively. Evidence for this specific-general relation between categories in the tense/aspect domain also comes from unidirectional diachronic trajectories—recurring regularities in the ways that grammatical morphemes undergo semantic change. Two such examples are given in (20).

(20) a. PROGRESSIVE » IMPERFECTIVE

Languages: Yoruba, Scots Gaelic, Turkish, Maa, Margi, Kui (Bybee et al., 1994; Comrie, 1976)

b. RESULTATIVE » PERFECT » PERFECTIVE/PAST

Languages: Kru, Chinese, Ewe, French, Italian, German (Dahl, 1985, 2000; Bybee et al., 1994)

Labeled grammaticalization paths or clines, these describe the typical unidirectional paths along which morphological formations restricted to a particular expressive function, appear to semantically expand in scope to cover a wider range of expressive functions. (20a) describes a pattern where a form or construction restricted to expressing events-in-progress is extended in use to other imperfective contexts, and exhibits characterizing or habitual/generic readings at a later diachronic stage. The original form apparently expands to have the properties of the imperfective aspect, following the basic organization in (8). (20b) describes another change in which a morphological form or construction originally restricted to expressing result states (e.g., a result-stative participle) is extended to a wider set of contexts, exhibiting the meaning of a perfect or perfective and simple past. The evolution of the Compound Past tense in Romance (Squartini and Bertinetto, 2000) and the development of the German Perfect into the general past tense marker illustrate this path.

The morphological findings from the grammaticalization literature present a challenging explanandum for theories of tense/aspect meaning reviewed in the previous sections. Most semantic research is synchronic, concerned with developing analyses of the distribution and interpretation of language-specific and crosslinguistically observed patterns. However, these robust patterns in the evolution of meaning of tense/aspect markers demonstrate that such theories must be able to account not only for the distribution of aspect markers at a single stage, but also for the changes in their distribution across stages and the compositional build-up of aspectual categories from distinct components of the periphrasis. The beginnings of this promising field of research are evidenced in recent work on diachronic semantics (Deo, 2006, 2009, in progress; Eckardt, 2007).

7. BLOCKING PHENOMENA IN SYSTEMS OF TEMPORAL MARKING

The grammaticalization literature concerns itself with how synthetic vs. analytic expression correlates both with relative recency of morphological formation and the type of semantic contribution. Composite synthetic-analytic paradigms have also received attention in morphological theory in the context of morphological blocking (Embick, 2000; Sadler and Spencer, 2000; Kiparsky, 2005) and the competition between syntax and morphology in the expression of temporal/aspectual (and other verbal) categories. The Latin Perfect paradigm has been particularly well investigated in this discussion because the same aspectual category is expressed synthetically *and* analytically depending on voice specification.

The Latin verb has a synthetic paradigm in both the active and the passive voices in each tense. The Latin Perfect, however, is synthetic in the active voice but analytic in the passive voice, with a participial form of the main verb (agreeing in number and gender) and a tensed form of the auxiliary *be* (*laudatus/a/um est*).

(21)	<i>Non-perfect</i>	<i>Active</i>	<i>Passive</i>
	Present	laudat 'praises'	laudatur 'is praised'
	Past	laudabat	laudabatur
	Future	laudabit	laudabitur
	<i>Perfect</i>		
	Present	laudavit	laudatus/a/um est
	Past	laudaverat	laudatus/a/um erat
	Future	laudaverit	laudatus/a/um erit

The question is: why does Latin not have uniformity of expression (synthetic or periphrastic) across the two voices in its Perfect subparadigm? From the lexicalist perspective, the inflectional paradigm is defective and the lack of inflectional morphology expressing tense, perfect, *and* passive features is filled by recruiting morphosyntactic resources of the language, i.e., by compositionally building up the

perfect passive by using the perfect participle (which carries the relative past E<R meaning associated with the perfect) and tense auxiliaries (Kiparsky, 2005). Kiparsky argues that this gap in the paradigm is principled; a synthetic perfect passive ending in Latin would express three features—tense, aspect, and passive—making it the only triple portmanteau in the language (Kiparsky, 2005, p. 126). Moreover, what prevents the periphrastic forms from surfacing in other areas of the Latin inflectional paradigm is an economy condition that prefers synthetic forms over analytic forms if both express the same meaning. This is morphological blocking in the traditional sense: The blocking mechanism acts as a filter that adjudicates between competing expressions based on their structural economy (for instance, inflection vs. periphrasis) and their semantic expressiveness. Synthetic forms, being simpler, are to be preferred over equally expressive analytic forms. The composite paradigm is therefore an outcome of the competition between a structural economy requirement and the need for expression of perfect passive meaning.

On another proposal framed within Paradigm Function Morphology (Stump, 2001), the Latin Perfect, and periphrastic paradigms more generally, are not derived syntactically, but rather morphologically, and should be modeled like word formation processes. Borjars et al. (1997) propose that composite paradigms not be treated as defective where gaps are filled by using syntactic resources, but rather, as complete paradigms with periphrastic forms in certain cells. Sadler and Spencer (2000), following this line of analysis, take a constructional view of the periphrastic perfect, where its building blocks (the participle and the auxiliaries) are devoid of meaning and only constructionally realize the meaning of the perfect aspect. The periphrasis is effectively stipulated as the exponent of an inflectional subparadigm by a morphological realization rule.³³ Further, the analysis proposes that the blocking relation is the converse of that assumed in both traditional and lexicalist analyses. It is the presence of the periphrastic forms and the rule that associates the syntactic construction with a morphological subparadigm that blocks the generation of synthetic perfect passive forms.

In contrast to this "syntax as word formation" approach to periphrasis is its direct opposite, the Distributive Morphology view of "word formation as syntax." Embick (2000) proposes that periphrastic and synthetic perfects are derived from the same syntactic structure and differ only in that synthetic perfects undergo a process of Merger, which leads to a postsyntactic fusion of the Aspect node that houses the auxiliary with the main verb, by adjoining the Tense+Agr node to the Aspect node. The passive perfect is analytic because such a merger is prevented by the presence of the passive feature.

Within the domain of tense and aspect, at least, periphrastic realization appears to be largely compositional rather than constructional. As Kiparsky (2005, pp. 123) notes, the perfect can be periphrastic *because* the meaning it contributes can be compositionally built up from the meaning of the participle (temporal anteriority) and the meaning of the auxiliary (tense). This is reinforced by the observation from the grammaticalization literature that the perfect is overwhelmingly realized periphrastically in the world's languages. This correlation emerges as an accident on any view that takes periphrastic and inflectional means of expression to have equal

status (whether as exponents of paradigmatic cells or as spellouts of syntactic structure). A view of morphological expression as driven by the competing forces of structural simplicity and semantic expressivity is far more compatible with the properties of tense/aspect periphrasis.

The principle of blocking has been fruitfully employed in yet another form in the tense/aspect literature. In contrast to morphological blocking, where formal and semantic constraints interact to adjudicate between competing expression types (synthetic or periphrastic) for a given meaning, is semantic blocking, where the same constraints serve to determine the interpretation associated with competing forms with overlapping meaning. The notion of general and specific semantic categories introduced in §6 is helpful in understanding how the distribution and interpretation of tense/aspect morphology is determined by such competition. We will examine this in the context of the effect of overt progressive marking.

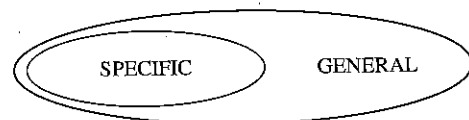
Visser (1970, p. 746) observes that in Middle English, before the emergence of the *be* + *V-ing* construction as a grammaticalized progressive, the English Simple Present exhibited progressive, stative, as well as the habitual, generic readings. In Modern English, however, the progressive reading (exemplified in (22)) is unavailable to the Simple Present.

- (22) a. What do you read, my lord? (*Hamlet* II.2.191)
 b. O, I die, Horatio. (*Hamlet* V.2.345)

The incompatibility of the Simple Present paradigm with an event-in-progress reading is connected to the grammaticalization of the specific progressive construction in Modern English. This change affects the distribution of present (and past) tense marking in the language, thus altering the temporal marking system in the language without affecting the temporal meanings of individual forms. Bybee (1994) labels this kind of introduction of systemic opposition "the grammaticization of 'zero' morphology."

Dahl (Dahl, 2000, pp. 10–11) introduces the notion of a "Doughnut Gram" to describe formal marking which fails to appear in certain semantic contexts that its meaning is compatible with, because its use is blocked by the presence of more specific formal marking.

(23)



Dowty (1980) posits a Gricean Blocking principle that can determine the distribution of two expressive devices with overlapping contexts of possible use.³⁴ The idea (originally due to the Sanskrit grammarian Pāṇini and heavily used in morphophonological analysis) is that given a context to which two rules may apply, the rule with a narrower domain of application takes precedence over the rule with a broader domain of application.

Hindi, which morphologically realizes both the imperfective and the progressive categories, exhibits a restriction on the distribution of imperfective marking in both the present and the past tenses (Deo, 2009). The imperfective form (Verb-*tā*) is incompatible with the event-in-progress reading which is uniquely expressed by the progressive (Verb + *rah*).³⁵ In contrast to English and Hindi, in Italian (and French), the presence of periphrastic progressive forms does not block the *Imperfetto* (and the *Imparfait*) from exhibiting the event-in-progress reading. Marchese (1979, p. 108) reports a similar pattern of free variation for Godié, a language of the Kru family.

This free variation scenario in Romance indicates that considerations besides semantic specificity/generality must determine the relative distributions of forms with overlapping meanings in a language. Koontz-Garboden (2004, Spanish) and Kiparsky (2005, Vedic Sanskrit) examine the free alternation of semantically broader tense-aspect forms with semantically narrower forms in the expression of narrower meanings, in terms of an optimizing competition between the two opposing constraints corresponding to semantic expressiveness and structural economy. The idea is that because progressive forms tend to be periphrastic (Dahl, 1985; Bybee et al., 1994), they are structurally more complex than imperfective forms, which are more likely to be synthetic. In a language where the imperfective-progressive or neutral-progressive contrast correlates with the periphrastic-synthetic morphological contrast, the distribution of the two forms is likely to be determined by the interaction of structural simplicity with semantic expressiveness. If the constraint favoring semantic specificity (EXPRESSIVENESS) is ranked above the constraint penalizing extra structure (ECONOMY), the result is a strict blocking relation that characterizes a language like English or Hindi. In these languages, the general forms (Simple Present and Imperfective respectively) are not compatible with an event-in-progress reading. On the other hand, in a language like Italian, it can be said that EXPRESSIVENESS and ECONOMY are freely ranked with respect to each other, which generates the pattern of free alternation between IMPF and PROG in the expression of the event-in-progress meaning.

- (24) a. EXPRESSIVENESS » ECONOMY (Hindi)
 b. EXPRESSIVENESS, ECONOMY (Italian, French)

The factorial typology in this domain is complete with the ranking of ECONOMY above EXPRESSIVENESS. Such a language is one in which a structurally complex form that expresses the specific event-in-progress meaning is not expected to surface. Middle English exemplifies such a language where the Simple present is compatible with the event-in-progress reading.

The brief analysis of semantic blocking presented here can be applied more broadly. Cipria and Roberts (2000) have proposed that the distribution of the Spanish *Preterito* and *Imperfecto* is determined by a similar blocking relation, where certain readings are pragmatically blocked for the more general *Preterito*. Kiparsky (1998) also models the distribution of the Aorist and the Perfect in Vedic along similar lines. The treatment of these phenomena in terms of an optimizing competition is only observed in later work on semantic blocking.

8. CONCLUSION

A morphologically grounded theory of tense and aspect is simultaneously concerned with the properties of the encoded meaning and the encoding itself. The recruitment of new lexical material in grammaticalization and the stable pathways of historical change in form and meaning demonstrate that diachrony is as central to such an investigation as is the synchronic study of individual tense/aspect markers and temporal marking systems. Moreover, we see that the formal constitution of such systems and the distribution of categories within them is structured by competing constraints of economy and expressiveness. An integration of the form-based insights from the typological and grammaticalization literature with the nuanced semantic theories of particular temporal—aspectual categories is necessary in bettering our understanding of the organization of this area of grammar.

NOTES

1. Pāṇini's *Aṣṭādhyāyī* (c. 500 BCE), which includes a concise morphological analysis of the verbal inflectional paradigms of Late Vedic Sanskrit, constitutes the first systematic treatment of tense/aspect morphology in any language.
2. For instance, the form labeled Imperfect in Tigre (Raz, 1983, pp. 70–72) has present reference in contrast to the familiar Indo-European usage of that label for the augmented past-tense, which is based on the present stem and has imperfective meaning in Latin and Greek, but is aspectually neutral in Sanskrit.
3. The abbreviations for Vedic are as follows: 3 = third person; SG = singular; PL = plural; ACC = accusative; GEN = genitive; IMPFCT = Imperfect; PFCT = Perfect. The terms Imperfect and the Perfect refer to the cognate forms of the morphological categories of Indo-European and not to their semantic function in Vedic.
4. The abbreviation for Wambaya are as follows: SG = singular; F = feminine; II = noun class II; ERG = ergative; A = Transitive subject; UNM = unmarked.
5. The overwhelming majority of remoteness marking languages are found in three geographical areas—sub-Saharan Africa, New Guinea, and western South America, in the two first of which predominantly (but not exclusively) in two large language families—Niger-Congo and Trans-New Guinea.
6. Aristotle distinguishes between *kineseis* (translated “movements”), which have an external end or goal, and *energiāi* (“actualities”), which are actualized as soon as they begin (*Metaphysics* 1048b).
7. The terms were coined by Garey (1957), based on the Greek word *télos* “goal.”
8. Dowty (1979) offers a synthesis of earlier work by the Oxford philosophers, integrating their diagnostics and introducing new ones, to show how the four aspectual classes pattern distinctly with respect to their logical entailments, their interaction with temporal adverbials (e.g., the *in/for* test), as well as tense/aspect morphology (e.g., entailments associated with progressive morphology). His conclusion deviates from the Vendlerian idea of a predetermined lexically encoded classification.

9. Vendler presents his classification as applying to the lexical verbs of English—for instance verbs like *love*, *know* are categorized as states, while verbs like *win*, *reach* are categorized as achievements. It has been pointed out, first in Garey (1957) and, later, since Verkuyl (1972), that the aspectual classification of verbs is not fixed once and for all, but rather appears to vary based on the properties of the arguments they combine with. Even Vendler's own examples (*draw a circle*) indicate that the aspectual classes cannot be restricted to the meanings of individual lexical verbs. The observation that verbs exhibit variability in their aspectual classification depending on the broader context of their use led to broadening the empirical scope of the Vendlerian classes to at least the level of VPs (verb + object argument), and in some cases, also to including the subject argument as a determinant of aspectual class (Verkuyl, 1972; Mourelatos, 1978; Dowty, 1979). Much later research on aspectual classes has focused on identifying the semantic underpinnings of the telic/atelic distinction and the compositional buildup of (a)telicity through the interaction of lexical verbs with other syntactic and morphological elements in the sentential structure (Bach, 1986; Krifka, 1989, 1992; Parsons, 1990; Filip, 1999 among others).
10. The original Reichenbachian system involves three temporal points whose relative locations determines the tense/aspect combination expressed in English. Later researchers tease apart the contribution of the tenses and the aspects via pairwise ordering between the temporal parameters (Hornstein, 1990; Klein, 1994).
11. Klein (1994) presents a reformulation of the basic Reichenbachian theory whose major advance is a proper characterization of the notion of reference time. On Klein's interpretation, Reichenbach's reference time is the time which the sentential assertion is about (in analogy with the notion of “topic” on other domains), and therefore, is rechristened Topic Time (TT). Because of ease of exposition and familiarity to the reader, I use the Reichenbachian names for the three times, rather than Klein's TSit (Time of Situation), TU (Time of Utterance), and TT (Topic Time). These parameters, however, have the same meaning as they do in Klein (1994).
12. A simplex verb may also be perfective. The addition of a verbal prefix to a lexically perfective verb maintains its perfectivity, but effects a change in its meaning.
13. There are twenty-eight prefixes that can be attached to an imperfective verb to yield a perfective one and up to sixteen prefixes can be compatible with one and the same verbal stem. (Altschuler, 2010, p. 20). Moreover, in some cases, the perfective form may also be formed via vowel change and stem change (Binnick, 1991, p. 136).
14. Comrie (1976: 93–94) locates prefixing aspectual systems on a diachronic scale, depending on the extent to which telicizing prefixes have been employed in realizing the perfective—imperfective contrast in a language. Languages like English and German, with prepositional particles that effect meaning changes but do not offer a systematic process of deriving perfective verbs from imperfective verbs, are at the least grammaticalized end of the scale. Languages like Lithuanian do have such a derivational process but not at the level of productivity exhibited in Slavic.
15. Perfective verbs have future reference when inflected in the non-past tense. For future reference with imperfective verbs, a periphrasis using the verb *bud* ‘be’ is required.
16. Formally, aspectual operators are existential quantifiers that apply to predicates of eventualities P and return sets of intervals t that correspond to the Kleinian/Reichenbachian reference times (Kratzer, 1998).
 - a. $[[\text{IMPF}]] = \lambda P \lambda t. \exists e [t \subset \tau(e) \ \& \ P(e)]$
 - b. $[[\text{PERF}]] = \lambda P \lambda t. \exists e [t \supset \tau(e) \ \& \ P(e)]$
17. Phasic theories of aspect (e.g., Vlach, 1981; De Swart, 1998; Kamp and Rohrer, 1983; Moens and Steedman, 1988) derive the (non)homogeneity of aspectually marked sentences in

English (the English Progressive) or Romance (the French Imparfait) by claiming that such sentences express stative eventuality predicates. The process by which stativity is achieved is mostly left unexplicated, lending a stipulative flavor to the analysis. However, on the relational approach to aspect, homogeneity manipulation is not stipulated, but rather, derived via temporal semantics of aspectual operators (Dowty, 1986, p. 44; Klein, 1994). It is the time relational contribution of the imperfective and the perfective that yields temporal predicates with/without the subinterval property. These predicates then interact in predictable ways with the reference time given by context in narrative discourse or overtly expressed by adverbials.

18. That is, there is no marking that is used only with lexical stative verbs to refer to states and with activities, accomplishments, and achievements to refer to events in progress (Bybee et al., 1994, p. 127).

19. This is not entirely accurate because progressive marking may also apply to lexical and derived stative predicates to refer to temporally contingent or temporary situation (Comrie, 1976; Dowty, 1979). See Deo (2009) for an account of this contingency reading of progressive marking.

20. While the modern English construction uses the present participial form of the verb with tense auxiliaries, the origin of this construction is highly debated. It is not clear whether the source is a participle-based construction or a locative construction. See Smith (2007) for a recent overview and proposal.

21. Following a common diachronic change, the periphrastic progressive construction has generalized as the imperfective marker in Modern Hindi.

22. Comrie calls these readings "types of perfect" suggesting that the different readings represent distinct grammatical subcategories of the perfect. While there is evidence for some morphologically encoded subdivisions within the domain of the perfect, it is not clear that each of these readings can be correlated to structural and semantic differences in aspectual meaning. See Dahl (1985, p. 133) for a similar statement.

23. The perfect aspect is yet another locus of debate regarding the correct underlying notions for the analysis of aspect. On the time-relational approach (6), the perfect indicates a temporal precedence relation (E<R) between the time of a situation and the reference time. Phasic theories of aspect (Moens and Steedman, 1988; Parsons, 1990; Kamp and Reyle, 1993), on the other hand, treat the perfect as asserting the existence of a state that results from the event that is described in the perfect-marked sentence. Finally, the Extended-Now approach (McCoard, 1978; Dowty, 1979; Iatridou et al., 2001), treats the perfect as making reference to an interval whose left boundary is before the reference time, but whose right boundary overlaps with the reference time. I refer the interested reader to Portner (2003) for overviews of these approaches.

24. Bybee and Dahl (1989, pp. 67–68) observe that perfect constructions in some languages may also involve the use of temporal particles such as *already* (e.g., Yoruba) and lexical verbs such as *finish* (e.g., Ewe).

25. For a full description of the uses of the Vedic Perfect, I refer the reader to Renou (1925), which is devoted to the Vedic Perfect and a more concise summary in Kiparsky (1998).

26. These constructions are often called resultatives in the typological literature (Dahl, 1985; Nedjalkov and Jaxontov, 1988; Bybee et al., 1994); however, I use the term resultative to distinguish them from compositionally built resultatives (*freeze solid*) discussed in the event composition literature.

27. Perfective marking on statives gives rise to an inchoative interpretation of the stative in Bulgarian (Iatridou et al., 2001, p. 171).

28. The tenses have been modeled either as existential quantifiers over times (an analysis emerging from Priorian Tense Logic and used in Montague's PTQ, 1973, as well as

Dowty, 1979) or as pronominals with temporal presuppositions that provide arguments to temporal predicates (Partee, 1973; Enç, 1986).

29. In (15), the Kleene star indicates that zero or more aspectual operators may apply to an eventuality description: the output of aspectual operators may serve as the input to other aspectual operators (De Swart, 1998; Michaelis, 2004, and others).

30. As noted in §4, aspectual markers can either be analyzed in terms of their event-structural contribution or their time-relational contribution. At least some kinds of aspectual marking, such as the perfectivizing affixes in Slavic, or the frequentative, iterative affix *-tar* in West Greenlandic (Van Geenhoven, 2004), are best analyzed as eventuality modifying, and therefore closer to the derivational end of the inflectional-derivational continuum.

31. The Arabic verbal system is organized around the Binyanim or the root-template system and the forms listed here belong to the first binyan for the root *ktb* (McCarthy, 1981; Ryding, 2005).

32. For ease of exposition, I have given only the first person singular forms in the present tense. The remaining paradigm for the present parallels this form in all relevant respects. Moreover, the past progressive is formed with a past auxiliary based on the same verb and undergoes the same diachronic process. /č/ marks progressive aspect in both tenses.

33. This rule is actually a rule of referral in the sense of Stump (2001). The syntax independently generates a form to which the morphology refers as the exponent of some subspace of a morphological paradigm (Sadler and Spencer, 2000, p. 89).

34. "If a language has two (equally simple) types of syntactic structures A and B, such that A is ambiguous between meanings X and Y while B has only meaning X, speakers of the language should reserve structure A for communicating meaning Y (since B would have been available for communicating X unambiguously and would have been chosen if X is what was intended)." (Dowty, 1980, p. 32).

35. This form also exhibits the contingent characterizing reading available to the English Progressive. See Deo (2009) for an explicit characterization of the meanings of the imperfective and the progressive that account for the patterns of distribution and interpretation of these categories in languages.

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