

The Acquisition of Lexical and Grammatical Aspect



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Peter Jordens

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Ping Li and Yasuhiro Shirai

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To Rose, Jessie, and Foong Ha

Preface

This book grew out of our continuous engagement in research and career development since our graduate school years. Although the book is intended to represent the most up-to-date understanding of the acquisition of lexical and grammatical aspect, some of the work discussed here goes back to our dissertation research in the late 80's and early 90's. When we first talked about writing this book, we did not anticipate that it could take so long, but now we are pleased to see the outcome of this book in the new millennium.

This book represents a joint enterprise: we wrote five of the eight chapters together, although each of us had main responsibilities for specific sections within each chapter. We wrote the following three chapters separately: PL wrote Chapter 5 (Acquisition of Chinese) and Chapter 7 (A connectionist model of the acquisition of aspect), and YS wrote Chapter 6 (Acquisition of Japanese). Even with these three chapters we commented on each other's writing extensively, and revised and re-revised on the basis of several rounds of comments from each other. Without doubt, there may still be inconsistencies both in style and in content, given the inevitable differences between any two authors on what constitutes the best style. However, we are both responsible for any imperfections that may still exist.

Bulk of the writing was completed during the summers of 1998 and 1999, when one of us (PL) was a visiting scientist at the Max Planck Institute for Psycholinguistics, Nijmegen. Countless emails and attachments crossed the Atlantic Ocean between Nijmegen and Ithaca. At the dawn of this new era, as we review the greatest achievements of the last century, we must thank the technological advancement of computers (and the internet), without which this book would not have been possible.

Although we did not specifically plan to meet each other to discuss our book plan, there were three opportunities when we attended the same scholarly meetings, at which times we were able to discuss the details of the book in person. We are indebted to our colleagues who organized these meetings: John Whitman at Cornell University (workshop on First Language Acquisition of East Asian Languages at the LSA Summer Linguistic Institute, July 1997), Eve Clark at Stanford University (Child Language Research Forum, April 1999), and Mineharu Nakayama at the

Ohio State University (International East Asian Psycholinguistic Workshop, August 1999). The papers that we were urged to present at these forums also served as catalysts to the writing of the book.

We owe the idea of this book first to Peter Jordens, who had urged us to produce such a work since our graduate school days. Peter's encouragement has been a constant source of stimulation, without which this book could not have come into existence. We would also like to thank a number of our colleagues who contributed to the development of this book in various ways. Melissa Bowerman, Wolfgang Klein, and Roger Andersen were our graduate mentors, whose insights into language acquisition and whose crosslinguistic studies are reflected in the book in many important respects. Eve Clark kindly read the first four chapters during the summer of 1998, when she was at the Max Planck Institute for her sabbatical leave. She provided many constructive comments that helped us greatly in the revision of the book. Joanna Luks also read the first four chapters and provided extensive comments, and Kevin Gregg read all the chapters of the final version of the book, and provided extensive feedback on both style and content. Other colleagues have also commented on our work presented here, and we are grateful to them: Elizabeth Bates, Bernard Comrie, Mary Erbaugh, Maya Hickmann, Brian MacWhinney, Dan Slobin, Carlota Smith, Dirk Vorberg, and Richard Weist. Risto Miikkulainen gave very helpful comments and suggestions on the use of DISLEX and self-organizing feature maps, and Curt Burgess and Kevin Lund kindly made their HAL semantic vectors available to our modeling. We also thank Kelly Cox and Collin Raymond for helping us with formatting the book to the stylistic specifications of Mouton. Ann Beck and the staff at Mouton provided very helpful editorial assistance on the format of the book. Cecelia Coleman gave us many useful hints on using Microsoft Word. Needless to say, we are solely responsible for any deficiencies that may still remain.

We extend our gratitude to the Max Planck Institute for Psycholinguistics for providing summer support as well as a congenial working environment for this project. The writing of the book has also been supported by a Faculty Research Grant from the University of Richmond (#F97419) and a grant from the National Science Foundation (#BCS-9975249) to PL, and grants from the East Asia Program (Japan Travel Award) and the Society for the Humanities at Cornell University to YS.

Finally, we want to dedicate this book to our loved ones, Rose and Jessie (PL), and Foong Ha (YS). The writing of the book took away

many hours of family time, when our loved ones had to spend lonely weekends and holidays at home. The most difficult times were Christmas Eve and New Year's Eve, when one of us (PL) had to leave home and work on the final touches of the book. Jessie (6;9) said on the last day of 1999 to PL: "Daddy, you are a liar – every day you say you'll come home at 4 o'clock but you always come home at 7. Today if you don't come back at 4, I will dial 911..." Hopefully, the amount of time and energy we devoted to the book will be proportional to the book's scholastic contribution.

January 5, 2000, Richmond, VA and Ithaca, NY

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Chapter 1

Introduction

1.1. *What is aspect?*

The expression of time is one of the central conceptual domains of language, and the acquisition of the ability to talk about time is one of the earliest tasks in language acquisition. We speak of situations as being in the past, present, or future, and we talk about events as ongoing or completed. Languages differ in the resources they offer us for expressing temporal meanings, but they can all express these basic concepts about time.

Two of the most important grammatical systems for expressing temporal concepts in the world's languages are tense and aspect. In learning to talk about time, the task for child and adult learners is to acquire the systems of tense and aspect. This book is about the acquisition of aspect. It is concerned with the ability of young children and adult second language learners to acquire the meanings and uses of aspect marking. Consider the language learner faced with the following pair of sentences:

- (1) a. *Sam made a big toy house for Jessie.*
b. *Sam was making a big toy house for Jessie.*

A mature understanding of this pair of sentences involves that (1a) implies that the toy house was actually completed and ready for use, and that (1b) simply states the fact that Sam was engaged in making the toy house, without implying that the house was completed. This semantic difference is due to the difference in aspect marking: in (1a) the verb is marked with a perfective aspect, while in (1b) it is marked with an imperfective or progressive aspect. Part of the task for the child or the adult learner in the acquisition of aspect is to figure out this difference.

1.1.1. *Tense, aspect, and modality*

Aspect is one of a trio of categories involving linguistic markings on verbs, often collectively referred to as the tense-aspect-modality (TAM)

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system. Thus, any in-depth discussion of aspect must take into consideration not only the independent functions of these categories, but also the interrelationships between them.¹

Briefly, modality is a linguistic category that characterizes the attitude of the speaker concerning the proposition expressed in an utterance. Examples of such attitudes include the notions of obligation, necessity, ability, possibility, and reality. By contrast, tense is a linguistic category typically used to locate the time of the event being talked about (i.e., event time) with respect to the time at which the speaker utters the sentence (i.e., speech time). Event time can also be specified with reference to some time other than speech time, i.e., reference time. When event time is prior to speech time, we use the past tense; when speech time is prior to event time, we use the future tense; and when the two overlap, we use the present tense. Note that in all of these cases, speech time and reference time overlap. When they do not overlap, we use tense markings such as the pluperfect (event time prior to reference time and reference time prior to speech time) or the future perfect (speech time prior to event time and event time prior to reference time) (see Comrie 1985 for a detailed discussion of the relationships between event time, speech time, and reference time). Finally, aspect is a linguistic category that characterizes how a speaker views the temporal contour of a situation described. In contrast to tense which is concerned with the relationship between situations at different time points, aspect is the means with which speakers discuss a single situation, for example, as beginning, continuation, or completion. Traditionally, aspect is divided into two basic perspectives: perfective versus imperfective (see Comrie 1976). In Chapter 2 we will discuss the various aspectual perspectives in detail.

Having identified the essential functions of each of these categories, we must note that the boundaries between them are often not clear-cut. First, the linguistic forms that express each of these notions tend to grammaticize into other categories (Bybee, Perkins, and Pagliuca 1994). For example, it has been observed that across different languages, modal markers denoting notions such as possibility, probability and intention tend to grammaticize into future tense markers, while completive and resultative aspect markers tend to develop into past tense markers. As a result, at various points during grammaticization, it is often not easy to determine whether a form belongs to one category or the other. This is a diachronic reason for boundary obfuscation. Second, a linguistic form can often have more than one of these functions. For example, across

languages past tense forms often have *irrealis*, counterfactual meanings (Lyons 1977; Dahl 1997), which are in the realm of modality, and perfect marking, which is itself intermediate between tense and aspect, often has inferential, evidential modal meanings (Bybee, Perkins, and Pagliuca 1994). This is a synchronic reason for boundary obfuscation.

Our approach to the acquisition of aspect assumes that the category boundaries between tense, aspect, and modality are not discrete, and therefore our investigation will not be limited to the acquisition of aspect *per se*. In particular, we will discuss the acquisition of aspect along with the acquisition of tense, for the following reasons.² First, the acquisition of tense has been shown to closely parallel the acquisition of aspect. It has been claimed that in various languages children use past tense markers to denote aspectual notions (i.e., perfective aspect, see more in 3.2.1). Second, as outlined above, both tense and aspect are terms that refer to the notion of temporality. In some languages, a given linguistic device can encompass both functions of tense and aspect: the most apparent example might be that of the English past tense, which marks both the past tense and the perfective aspect (Comrie 1976).

1.1.2. Grammatical aspect vs. lexical aspect

There are two types of aspect that have played an important role in past research in the acquisition of aspect: grammatical aspect and lexical aspect. Grammatical aspect, also known as viewpoint aspect (Smith 1983, 1997), refers to aspectual distinctions which are marked explicitly by linguistic devices, usually auxiliaries and/or inflectional and derivational morphology. The progressive aspect in English and the perfective/imperfective aspect in languages such as Spanish, Russian, and Greek are examples of grammatical aspect.

Lexical aspect, also known as situation(al) aspect, inherent aspect, or Aktionsart,³ refers to the characteristics of what is inherent in the lexical items which describe the situation. For example, *know* is inherently stative (i.e., continuous and homogeneous), while *jump* is inherently punctual (i.e., momentary and instantaneous). Vendler (1957) proposed a four-way classification of the inherent semantics (i.e., lexical aspect) of verbs – achievement (e.g., *fall*, *die*), accomplishment (e.g., *make a chair*), activity (e.g., *run*, *play the guitar*), and state (e.g., *love*, *know*). While accomplishments have some duration, achievements and accomplishments both share the feature of having a clear endpoint (i.e., they are

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telic). Achievement differs from the other categories in that achievement verbs are not durative; state differs from the other categories in that state verbs are not dynamic; see section 2.2 for more details. This four-way classification of the inherent semantics of verbs has become the starting point for any subsequent research on lexical aspect.

1.1.3. Typological and crosslinguistic differences in aspect

Although claims have been made for the universality of aspectual categories (Smith 1997), variations exist across languages. First, at the level of lexical aspect, it may be that languages differ in how categories of lexical aspect are realized. For example, Smith (1997) suggests that achievements in Chinese do not include process leading up to the change-of-state in its scope, whereas those in English do. Second, languages differ enormously in how aspect is grammatically encoded. Some languages do not grammatically mark aspect (e.g., Hebrew), whereas others do not encode tense but only aspect (e.g., Chinese).⁴ In Romance languages, the perfective-imperfective distinction in aspect is restricted to past tense. An added complication to this picture is that aspectual forms with the same label often have different meanings in different languages: for example, the progressive marking in English (be + V-*ing*) can denote various extended meanings such as futurate and habitual, whereas the Chinese progressive marker *zai* is mainly restricted to the meaning of action-in-progress.

The challenge involved in the acquisition of aspect is that learners need to acquire both lexical aspect, which is relatively similar across languages, and grammatical aspect, which differs widely across languages. How do they learn categories of lexical aspect, and how do they learn the grammatical aspect marking and its interaction with lexical aspect? One of the goals of this book is to present an overview of the various theoretical accounts of how young children and second language learners acquire grammatical and lexical aspect. But before we proceed, let us first examine the potential psycholinguistic insights we can gain from the study of the acquisition of aspect.

1.2. Significance of the study of the acquisition of aspect

One undercurrent in contemporary linguistics has been to assign an increasingly significant role to the lexicon as the organizing system for the basic structure of language (Bresnan 1982; Levin 1993; Levin and Pinker 1992). The lexicon-based approach advocates that the lexicon contains essential information not only about the semantics of individual lexical items, but also about how the lexical items are organized and combined in a sentence. Parallel to this trend, researchers in language acquisition are asking the questions of how the learning of word meanings can help children acquire grammatical categories (e.g., Pinker 1984, 1987) or how the sentence context can help children acquire lexical semantics (e.g., Gleitman 1990; Landau and Gleitman 1985; Li, Burgess, and Lund 2000). Aspect, as we have defined it, stands at the interface between the lexicon and the grammar. Lexical aspect contains information about the semantic properties of lexical items, and grammatical aspect conveys information, usually expressed by morphological devices, about grammatical categories.

Aspect has generated a great deal of interest in the domain of language acquisition. Most previous studies of the acquisition of aspect acknowledge that there is an interesting interaction between inherent verb meanings and tense-aspect markers in child language (see Shirai, Slobin, and Weist 1998 for a recent discussion). An important finding across languages is that children's early use of progressive markers (e.g., English *-ing* and Chinese *zai*) is associated with verbs that name durative, nonresultative events, while past or perfective markers (e.g., English *-ed* or Chinese *-le*) are associated with verbs that name punctual, resultative events. Brown (1973) observed that English-speaking children first use past-tense forms with a small set of punctual and resultative verbs, including *fell*, *dropped*, *slipped*, *crashed*, and *broke*. Bloom, Lifter, and Hafitz (1980) showed that at around age 2, *-ing* occurred almost exclusively with verbs such as *play*, *ride*, and *write* (durative, nonresultative), whereas the past tense forms occurred with verbs such as *find*, *fall*, and *break* (punctual, resultative). Similar results have been obtained with older children, and in other languages including Chinese, French, Italian, Japanese, Polish, and Turkish.⁵ This type of "undergeneralized" use of tense and aspect markers (i.e., the use of these markers more restrictively than in the adult language) may be a direct reflection of the child's awareness of the schematic structure of the lexicon with which tense and

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aspect markers co-occur. In this book, we attempt to take the acquisition of aspect as an entry point for understanding the complex relationships between the semantic structure of the lexicon and morphology in language acquisition.

How can we clearly define the semantic structure of the lexicon? Linguists have approached this question in various ways. Aspect presents a good example in this regard. Comrie (1976), Mourelatos (1981), Smith (1991, 1997), Vendler (1957), among many others, have attempted to define lexical aspect as individuated categories (e.g., activities, accomplishments, achievements, states), contrastive pairs (e.g., durative vs. punctual, state vs. process), or hierarchical structures (e.g., dynamic vs. non-dynamic, and telic vs. atelic within dynamic). Each of these classifications or categorizations has its own virtues but at the same time presents difficult problems. One of the difficulties is how to deal with many verbs that seem to be borderline cases. For example, the verb *understand* may be treated as a stative verb, because the understanding of something implies a continuous, homogeneous, and relatively effortless event, as in *John understands my problem very well*. But it may also be examined as an achievement verb (in Vendler's terms), in the sense that the point of understanding in time may be instantaneous, as in *Suddenly John understood the story*. Another example is *open* as in *John opened the box*: if the box was one that can be opened instantaneously, *open* indicates an achievement; if the box was carefully wrapped and it took time to open, *open* indicates an accomplishment (Shirai and Andersen 1995). These examples serve to demonstrate the fuzziness and flexibility of semantic categories. Traditional approaches seem to be insufficient to account for these complex relationships of lexical semantics (Li and MacWhinney 1996; Li and Bowerman 1998). This difficulty has led us to propose that lexical aspect categories may be treated on a par with covert semantic categories or "cryptotypes" (Whorf 1956), and the acquisition of the grammatical categories of aspect can be examined as the emergence of prototypes in connection with that of cryptotypes. In this book, we attempt to outline such a proposal in order to understand the mechanisms that govern the acquisition of lexical and grammatical aspect.

The study of the acquisition of aspect is important not only because aspect bears great linguistic significance (e.g., the lexicon-morphology interface) and presents interesting learning problems (e.g., covert semantic categories), but also because it can help us to test a number of influential theories of language acquisition. In the last twenty years, there

have been at least two major theoretical proposals that draw heavily on the acquisition of tense and aspect: the Language Bioprogram Hypothesis (Bickerton 1981, 1984), and the Basic Child Grammar hypothesis (Slobin 1985). According to the Language Bioprogram Hypothesis, certain semantic distinctions are biologically pre-programmed and emerge early in language acquisition. For tense and aspect, two such distinctions are *state* versus *process* and *punctual* versus *nonpunctual*. Bickerton hypothesized that early on in language acquisition, states should be marked differently from processes, and punctual situations differently from nonpunctual situations. According to the Basic Child Grammar hypothesis, children come to the language acquisition task with a prestructured "semantic space" containing a universal, uniform set of prelinguistic semantic notions. Two notions, process and result, define a basic semantic contrast in children's acquisition of tense and aspect and they provide an early mapping point for children to associate grammatical morphemes with content words referring to actions.

The Language Bioprogram Hypothesis and the Basic Child Grammar hypothesis both explain the acquisition of tense and aspect by reference to innate or prelinguistically determined factors. However, in recent years, proposals of this nature have been questioned by researchers who emphasize the role of the linguistic input and the extraordinary ability children display in analyzing patterns of the input (e.g., Bowerman 1985, 1989, 1996; Li 1990; Li and Bowerman 1998; Stephany 1981; Shirai and Andersen 1995). In this book, we attempt to present a comprehensive overview of the various theoretical hypotheses about the acquisition of aspect, and evaluate these hypotheses with respect to empirical evidence from crosslinguistic studies of English, Chinese, and Japanese, in both first and second language acquisition. In particular, we present a proposal that emphasizes the remarkable ability of the learner (child, adult, and connectionist network) at extracting patterns from the linguistic input and at forming patterns of association between the lexicon and the morphology.

In sum, the study of the acquisition of aspect can provide significant insights into how young children and adult second language learners acquire one of the central conceptual domains of language, the expression of temporal notions through lexical and morphological structures, and can shed light on the psycholinguistic mechanisms underlying the acquisition process. Aspect is one of the earliest devices in child language acquisition (e.g., *-ing* is the first inflectional morpheme produced

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by English-speaking children; Brown 1973), and one of the earliest but probably the most problematic in second language acquisition (Dietrich, Klein, and Noyau 1995). The acquisition of aspect involves the acquisition of the semantic structure of the lexicon and the systematic application of the morphology. The understanding of the acquisition of aspect allows us to test important theoretical models that have been offered to account for language acquisition.

1.3. Goals of the book

At the conception of this book, we had two general goals in mind. First, we wanted to provide a comprehensive overview of the state of the art in research on the acquisition of aspect. The last twenty years or so have seen a large amount of research in this area, yet there has been no integrative text on this topic. Second, we wanted to examine the acquisition of aspect from both developmental and crosslinguistic perspectives, with an eye toward the computational mechanisms that govern the learning process. Our academic history reflects these perspectives. Both of us completed our doctoral studies on the acquisition of aspect, one primarily concerned with Chinese and the other with English. We subsequently pursued these studies, largely in a crosslinguistic context, in both first language acquisition and second language acquisition. One of us joined the “connectionist camp” at UCSD and pursued computational studies of the acquisition of semantic structures. These perspectives on the acquisition of aspect have led us to consider specific issues within the framework of three general questions: (a) how children build and organize lexical and morphological systems, (b) how the learning process may vary across languages, and (c) what psycholinguistic and computational mechanisms best capture acquisition patterns such as overgeneralization (e.g., applying *-ing* to stative verbs) and undergeneralization (e.g., applying *-ed* too restrictively).

To recapitulate the specific goals of this book as outlined in 1.2., first, we attempt to take the acquisition of aspect as an entry point for understanding the complex relationships between lexical semantics and morphology in language acquisition. Second, we attempt to present a comprehensive review of the various theoretical hypotheses that pertain to the acquisition of aspect, and evaluate these hypotheses with respect to empirical evidence from crosslinguistic studies of English, Chinese, and Japanese, in both first and second language acquisition. Finally, we

attempt to examine the acquisition of aspect as a crucial case in understanding the learner's remarkable ability to extract input patterns and form linguistic associations.

The book is organized as follows. Chapter 1 is an introduction to aspect and the significance of the study of the acquisition of aspect. Chapter 2 takes a detailed look at linguistic research on grammatical and lexical aspect. Chapter 3 gives an overview of current debates in developmental psycholinguistics and in second language acquisition, and examines several specific hypotheses concerning the acquisition of aspect. Chapters 4 through 6 are in-depth examinations of the acquisition of aspect in English, Chinese, and Japanese, respectively. Chapter 7 presents a connectionist model of the acquisition of aspect. Finally, Chapter 8 provides a summary and evaluation of our studies, an overview of our theoretical stance, and an examination of the implications that the study of the acquisition of aspect has for theories of language acquisition.

Chapter 2

Aspect: Problem of lexicon and morphology

In this chapter we outline several of the influential linguistic analyses of aspect in the literature, and examine how these analyses treat grammatical aspect, lexical aspect, and the interaction between the two. We will begin by looking at Comrie's analysis of perfective and imperfective aspect, and then proceed to Vendler's categorization of verbs and times, Smith's two-component theory of aspect, and Klein's view on aspect in terms of the relationship between topic time and situation time. We end with a discussion of how these various linguistic analyses bear on children's acquisition of aspect.

2.1. Grammatical aspect

2.1.1. Perfective and imperfective

The grammatical encoding of aspectual notions, which we call *grammatical aspect*, is realized in different languages in different ways, for example, through the use of inflectional morphology, derivational morphology, auxiliary, or periphrastic constructions. This variation does not mean, however, that grammatical aspect is wholly idiosyncratic and language-specific in the way it is encoded. Typological studies of how languages of the world encode aspectual notions have uncovered recurring patterns of aspectual marking (Comrie 1976; Bybee 1985; Dahl 1985; Bybee and Dahl 1989; Bybee, Perkins, and Pagliuca 1994). In this section, we characterize these grammatical aspectual patterns and show how they are related to each other.

The most basic aspectual opposition that is often encoded grammatically is that of perfective and imperfective. As noted in Chapter 1, perfective aspect presents a situation as an unanalyzed whole (external view), whereas imperfective aspect presents a situation from within (internal view). In the following example from English,

- (1) *John built a house.*
- (2) *John was building a house.*

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sentence (1) is aspectually perfective, whereas sentence (2) is aspectually imperfective. In sentence (1), the perfective aspect of the verb reports the situation in its entirety, with the speaker presenting the situation including its initial and terminal points. Thus, sentence (1) entails completion: John finished building a house. In contrast, the imperfective aspect in sentence (2) communicates the internal structure of the event, without regard to its beginning and end points. Thus the meaning of the sentence is non-committal as to whether or not John has finished building the house.

Comrie (1976: 25) proposed the following hierarchical classification of aspectual categories.

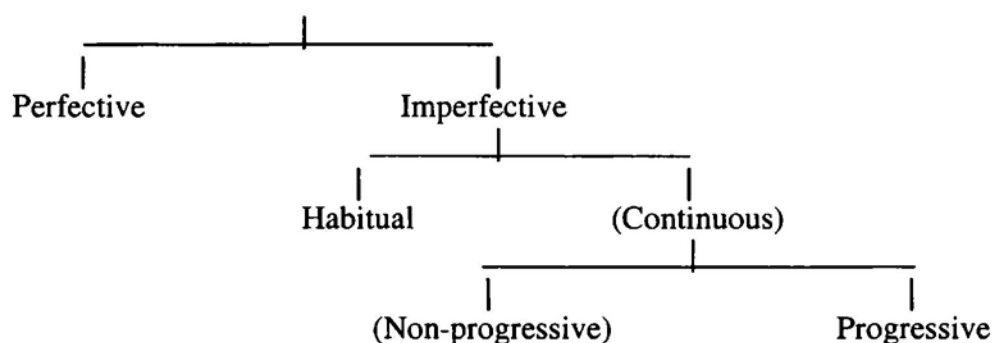


Figure 2.1. Classification of aspectual oppositions (adapted from Comrie 1976: 25)

Comrie divided imperfective aspect into habitual and continuous, and further subdivided continuous into progressive and non-progressive. Let us characterize these categories from the bottom up, following Comrie (1976).

Progressive aspect is a category of imperfective that has the properties of dynamicity and change as its defining features: typically it denotes a dynamic, continuously changing action in progress, and is generally incompatible with stative predicates (**He is knowing the answer*).

Habitual aspect denotes a situation that spans an extended period of time, typically involving repetition of an action over multiple occasions. English has a habitual aspect marker (*used to*) which is used in past-time reference only.

Imperfective aspect, sometimes referred to as *general imperfective*, denotes both habitual and continuous (i.e., progressive and non-progressive) qualities. For example, Romance languages grammatically encode the perfective-imperfective distinction in the past, and the imperfective past can describe a past action in progress (i.e., progressive), a

past state (i.e., non-progressive),⁶ and a past habit. For instance, the Spanish imperfective past form can express the equivalents of *he was dancing*, *he loved Mary*, and *he used to dance*.⁷

It is interesting to note here that Comrie failed to explicitly characterize the categories of continuous and non-progressive. He defined continuousness in the negative, that is, as imperfectivity that is not habitual, and he did not define “non-progressive” (Bybee, Perkins, and Pagliuca 1994: 138). This may be related to the fact that the aspectual markers that specifically denote these categories are extremely rare.⁸ For this reason, the two categories appear in parenthesis in Figure 2.1.

2.1.2. Grammaticization of aspect markers

As noted in Chapter 1, there is a tendency for the meanings and functions of tense-aspect markers to change over time. For example, it is claimed that progressive aspect markers can develop into more general imperfective aspect markers by generalizing their applicability to habitual and non-progressive situations. In this subsection, we discuss grammaticization of tense-aspect markers to explain how different tense-aspect markers are related to each other, both semantically and historically.

Building on research from historical linguistics and crosslinguistic survey of typologically diverse languages, Bybee, Perkins, and Pagliuca (1994) proposed hypotheses concerning the grammaticization of tense-aspect-modality markers. Particularly relevant to our research are two hypotheses concerning the universal paths of the development of tense-aspect markers. According to these authors, first, there is a universal tendency for resultative and completive markers to grammaticize into perfect markers, which in turn become perfective or simple past markers. Second, there is a tendency for a progressive marker to develop into a general imperfective marker by expanding its reference to habitual and stative situations; in terms of Comrie’s hierarchy (see Figure 2.1), imperfective aspect markers develop from the bottom up.⁹

Here, we would like to discuss the perfective path in more detail, primarily to explicate the nature of the category *perfect*. Bybee, Perkins, and Pagliuca (1994) claimed that completive and resultative aspect markers grammaticize into perfect markers. Completive markers denote an action performed completely and thoroughly, and resultative denotes a state that has been brought about by a prior action. These markers then

extend their meaning and become perfect markers, which denote “past action with current relevance”. English perfect (*have* + past participle) is a typical example of this category (Dahl 1985), which has such uses as “perfect of result”, “perfect of experience”, etc. Perfect further grammaticizes and loses its “current relevance” restriction, and becomes a perfective aspect marker and/or a simple past tense marker.

It is often the case that a past tense marker also has an aspectual value. For example, many European languages (e.g., French, Spanish, German, Dutch) have the perfect form grammaticizing into a past tense form which also has a perfective value, although the degree of grammaticization differs. Thus, in these languages, they have two past tense markers – older past forms (often referred to as *preterite*), and more recent past forms (auxiliary plus participle). As noted in Chapter 1, what we see here is a continuous development of tense-aspect markers, which often makes it very difficult to explicitly determine whether a grammatical form is a tense marker or an aspect marker.

Interestingly, this historical development charted for tense-aspect markers has been found to have a parallel in language acquisition. In Chapters 3 through 6, we will discuss in more detail the claim that children use past tense marking first as a resultative aspect marker and then as a pure past tense marker, and that progressive markers are initially restricted to the action-in-progress meaning and only later develop more varied meanings (e.g., Antinucci and Miller 1976; Bloom, Lifter, and Hafitz 1980; Shirai and Andersen 1995). This claim about the acquisition of tense-aspect morphology has also been discussed within the larger issue of how and why there are parallel processes in language acquisition and historical change (Slobin 1977, 1997; Ziegeler 1997).

2.2. *Lexical Aspect: Vendler, Smith, and Comrie*

Grammatical aspect provides a certain amount of information for the interpretation of the aspectual meaning of verbal predicates, but most linguists accept that we need to consider another type of aspect – lexical aspect. Lexical aspect (also known as inherent aspect, situation aspect, or *Aktionsart*) refers to the semantic characteristics inherent in the lexical content of words, usually verbs or verb phrases, that are defined in terms of the temporal properties of given situations that the verbs describe. Because lexical aspect deals with lexical semantics, it is generally re-

garded as a lexical category as opposed to the grammatical category of “grammatical aspect”.

As a starting point for our illustration, Vendler’s (1957) four-way classification represents an early attempt to categorize lexical aspect.¹⁰ He classified verbs or verb phrases into four categories with respect to the temporal properties that they encode: *activities*, *accomplishments*, *achievements*, and *states*. According to Vendler, activity verbs encode situations as consisting of successive phases over time with no inherent endpoint, for example, *walk*, *run*, and *swim*. Accomplishment verbs also characterize situations as having successive phases, but they differ from activity verbs in that they encode a natural endpoint and often a change of state, for example, *paint a picture*, *build a house*, and *run a mile*. Vendler illustrated the contrast between activities and accomplishments by the difference between *run* and *run a mile*. The sentence *John was running* entails that John ran, whereas the sentence *John was running a mile* does not entail that John ran a mile, that is, John might have stopped halfway. Like accomplishments, achievement verbs also encode a natural endpoint, but they differ from accomplishments and activities in that they encode events as punctual and instantaneous, that is, as having no duration, such as in *fall*, *win the race*, and *reach the summit*. Strictly speaking, every event occupies time. But speakers can construe given verbs as denoting situations having no time duration. Finally, state verbs, in contrast to the other three categories, encode situations as homogeneous, with no successive phases or endpoints, involving no dynamicity, such as *know* and *love*. Thus, state verbs cannot usually be combined with progressive aspect that marks change and development from one phase to the next (e.g., **John is knowing the story* is odd).¹¹ These categories can be schematically represented as follows (Andersen 1990).

State	—————	<i>love, contain, know</i>
Activity	~~~~~	<i>run, walk, swim</i>
Accomplishment	~~~~~X	<i>paint a picture, build a house</i>
Achievement	~~~~~X	<i>fall, drop, win the race</i>

In this schematization, a solid line is used to represent states, because states have no apparent beginning point or endpoint and endure indefinitely unless some external force changes them. The wavy lines for activities and accomplishments indicate the dynamic duration of an action, while x for accomplishments and achievements represents a

punctual point of change of state, signaling telicity (i.e., natural endpoint).

Vendler's analysis, now probably the most widely accepted and the best known, has become an important starting point for subsequent research on lexical aspect. For example, Smith (1997) recently modified this system and applied it to an analysis of English, French, Chinese, Russian, and Navajo. Smith's modification involved mainly the addition of "semelfactive" verbs, such as *cough*, *tap*, and *knock* in English and their equivalents in other languages. She argued that semelfactives resemble achievements in being punctual, but differ from achievements in that semelfactives encode no endpoint. In particular, semelfactives and achievements behave differently with progressive aspect marking: when semelfactives are marked with progressive, they are interpreted as specifying a repeated event (e.g., *coughing* or *knocking* several times); when achievements are marked with progressive, they are interpreted as indicating preliminary, detachable stages of the event rather than a repeated event (e.g., *John was reaching the summit* means that John was at a stage just prior to being at the summit, not that he arrived at the summit several times). In addition to Smith, other researchers have extended Vendler's analysis in other ways. For example, instead of using a categorical four-way classification, some linguists have classified verbs as pairs of contrasts, such as stative versus dynamic verbs, telic versus atelic verbs, and punctual versus durative verbs (Comrie 1976). These pairs of contrast have the advantage of making the semantic features of lexical aspect explicit and transparent. These contrasts can be reanalyzed as features, for example, [\pm dynamic], [\pm telic], and [\pm punctual]. Table 2.1 presents such an analysis, adapted from Smith (1991), to characterize Vendler's four categories plus semelfactives.

Table 2.1. Semantic features for the five categories of lexical aspect (adapted from Smith 1991: 30)

	states	activities	accomplishments	semelfactives	achievements
dynamic	-	+	+	+	+
punctual	-	-	-	+	+
telic	-	-	+	-	+

We should point out a confusion that has been in the literature on lexical aspect since Vendler (1957). Vendler did not use the terms lexical aspect, Aktionsart, situation aspect, or inherent aspect. He was speaking