

PERSPECTIVES ON ASPECT

STUDIES IN THEORETICAL PSYCHOLINGUISTICS

VOLUME 32

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Perspectives on Aspect

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Springer

A C.I.P. Catalogue record for this book is available from the Library of Congress.

ISBN-10 1-4020-3231-5 (PB)
ISBN-13 978-1-4020-3231-8 (PB)
ISBN-10 1-4020-3230-7 (HB)
ISBN-10 1-4020-3232-3 (e-book)
ISBN-13 978-1-4020-3230-1 (HB)
ISBN-13 978-1-4020-3232-5 (e-book)

Published by Springer,
P.O. Box 17, 3300 AA Dordrecht, The Netherlands.
www.springeronline.com

Printed on acid-free paper

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Printed in the Netherlands.

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PREFACE

In December 2001 the Utrecht Institute of Linguistics (UiL-OTS) hosted a conference entitled ‘Perspectives on Aspect’. The aim of the conference was to offer a retrospective view on the past thirty years of research on aspectuality and temporality as well as develop perspectives on the future development of the field. Invited speakers from different generations and different theoretical backgrounds gave overviews of the development of the field, presented the state of the art of current research, suggested new and upcoming lines of research, and debated important issues during very lively forum discussions. We sent out a call for papers so that other speakers could contribute their own work in presentations and poster sessions. An important theme throughout the conference was typological variation, and the relevance of empirical data for theory formation.

The current volume grew out of the papers presented at the conference. Not all speakers submitted a paper, so the full richness of the conference could not be repeated here. However, we think the volume reflects the main topics of the conference quite well. We thank the reviewers whose comments helped to improve the contributed papers. We are grateful for the financial support of the Netherlands Organization for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences (KNAW). We thank the Utrecht Institute of Linguistics (UiL-OTS) for financial and organizational help with the conference and with the preparation of this volume. Bert Le Bruyn provided invaluable editorial support. Finally, we wish to thank Jacqueline Bergsma and Jolanda Voogd for their support from Springer.

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INTRODUCING PERSPECTIVES ON ASPECT

1. BACKGROUND

Talking about different perspectives on a particular domain of investigation in a certain discipline may suggest a lack of common ground about which different positions can be taken on the basis of agreement about the main issues. In the absence of such agreement, the discipline in question often turns out to have not yet been sufficiently developed so that the disagreement can be explained by the lack of progress in the field. Such a situation is not imaginary: before the fifties of the past century linguistics itself could not be considered a discipline on the basis of shared opinions and on the type of questions under discussion.

We are happy to see that in the domain of aspectuality there is certainly a great number of convictions and opinions shared by most or all investigators. This has been achieved by a remarkable interaction between quite different perspectives in the past forty years. One of the things to be noted right away is that before this period, aspect was generally viewed as a phenomenon typical of Slavic languages (especially Russian), and had hardly received any attention outside the circle of Slavonic scholars. The current successful investigation of this very complex area has arisen from different disciplines having contributed to what now can be seen as a common, worldwide and interdisciplinary enterprise: the study of temporal phenomena in natural and formal languages by linguistics, psycholinguistics, cognitive psychology, philosophical and mathematical logic, computational linguistics, and artificial intelligence.

If we focus on linguistics, we see that the view on aspect has changed quite a bit. The developments of the last forty years show that the scope of the analysis has extended from the domain of (lexical) word morphology to the sentential domain and the domain of discourse. This change of scope also involves a change of perspective: the transition from morphology to the sentential domain made it possible to study more properly the division of labor between tense and aspect in different languages. Likewise, the extension from the sentential domain to the domain of discourse made it possible to get a better understanding of the contribution of aspectual information to the discourse structure, because certain aspectual differences can be made visible only in discourse.

Finally, different perspectives constitute a dynamic force in theory formation: it is necessary to confront theoretical proposals to a variety of options. In that sense,

one may observe that the aspectual domain is not only quite dynamic, but also that it has found a way to confront theoretical positions with real data. There is strong typological research in the area of tense and aspect, and the results substantially contribute to theory formation. The advent of electronic tools (real and accessible data bases) has facilitated this development. The typological and cross-linguistic papers included in the present volume confirm the current trend. Perhaps the fact that Slavic languages, in particular Russian, have traditionally been seen as the aspectual language(s) provides the ground for the conviction that an aspectual theory should be able to deal adequately (at least) with Slavic rather than with English before it can be taken seriously. And this may have led to a better sense for the need of an interplay between theory and data.

2. ASPECT AS A SEMANTIC PHENOMENON: A HISTORICAL OVERVIEW

This introductory chapter will be retrospective by giving a sketch of the most relevant developments that have led to the present situation and prospective by taking into account the contribution of current research and sketch some perspectives on future developments. In our view, the development that aspectuality came to be seen as a genuinely semantic phenomenon is due to the fact that formal semanticists became interested in it at a time that Chomskyan syntactic theory was mostly concerned with autonomous syntax. The cooperation between formal semanticists and linguists interested in semantic phenomena rather than syntax alone has determined the theory formation in the linguistic part of the domain of tense and aspect. Compositionality was the key notion that allowed linguists to go beyond the morphological encoding of aspect that we find in Slavic and address the scattering of aspectual information over the verb and its nominal complements in Germanic languages. Compositionality is necessary in order to break away from word morphology into the sentential domain. As Henk Verkuyl pointed out in his dissertation (1971, published as Verkuyl 1972), the idea was already available in the 1920's (Poutsma, Jacobsohn). The problem for the linguists in that period was the lack of a proper syntactic theory. This made it practically impossible for them to analyze the presence of complex semantic information in terms of the presence of more elementary elements in a syntactic phrase carrying this information. The gap between atomic and complex was simply too large at the time. Thanks to Chomsky's work in the fifties and sixties, Verkuyl was able to provide a syntactic basis for the interpretation of aspectual information as it is expressed in Germanic languages: at the VP level and higher. So, in fact, Verkuyl did what Poutsma could have done had syntactic trees been available to him: to use the possibility of combining semantic information contributed by V with the semantic information of the nominal complement of V into complex information at the level of VP (and carry this on to the sentence level).

Verkuyl's 1971-dissertation was available to David Dowty, who finished his PhD in 1972. Verkuyl had decided to use the polycategorical branch of generative semantics developed by Gruber (1965). For him the syntax of generative semantics

was not crucial for his view on aspectuality: what you can do to amalgamate the information MOVE + UNSPECIFIED QUANTITY OF X into DURATIVE, can also be done by [+move] + [-unspecified quantity of X] into [-terminative], as pointed out in Verkuyl (1972, 1976). Dowty's (1972) dissertation was genuinely generative-semantic in the sense that for him a node carrying word meaning may be structurally decomposed into more primitive nodes. This may explain, among other things, why Dowty adopted Vendler's system of aspectual classes: primitive nodes can be used to construe the four Vendler classes (states, activities, accomplishments, achievements). There are profound differences between the first two generative attempts to deal with aspectual phenomena, but they had one thing in common: both proposals were totally ignored in the autonomous-syntactic environment in which they were developed. Mainstream generative linguistics did not pay attention to aspectual phenomena in the early seventies. For both Verkuyl and Dowty this was the reason to extend their generative tool box with Montagovian machinery.

Barbara Partee attended one of the formal semantic courses taught by Richard Montague in the sixties. Thanks to Partee (1975), the American linguistic community was introduced to real semantics in the Fregean tradition. Partee's paper was very influential, the more so because Lewis (1972) had made it painfully clear that Katz/Fodor-semantics was nothing but a disguised form of the syntax of predication logic. Richard Montague's 1966 stay in Amsterdam prepared the ground for what later became the Amsterdam branch of formal semantics: his lectures (together with Frits Staal) were attended by mathematical logicians, philosophers of language, and linguists. This interdisciplinary movement resulted in the well-known Amsterdam Montague colloquia that came about in the mid-seventies and that are still very much alive.

The American and European lines of Montague grammar came together in the early eighties when Barbara Partee and Emmon Bach spent a sabbatical year at the Max Planck Institute in Nijmegen in Holland. In that period formal semantics became at least as fashionable as generative syntax, and the first attempts were made to bridge the gap between the two streams. The cordial relations between MIT and Amherst made formal semantics acceptable to hard core syntacticians and this led to a situation in the mid-eighties and nineties in which generative attention directed itself to the study of aspect and tense including the results of the period in which formal semantics had laid the foundations for the proper study of temporal phenomena in natural language. Dissertations on aspectuality appeared at UMass, Amherst (Zucchi, 1989; Green, 1993; Terry, 2004) and MIT (Tenny, 1987; Kipka, 1990; Kearns, 1991; Klipple, 1991; Musan, 1995), among others.

The interaction between linguists and logicians in the period between the end of the sixties and the early eighties led to a number of major developments and events in the domain of formal semantics, which together made the domain of tense and aspect an important field of investigation. Here are some highlights. The use of temporal logic in linguistic studies on tense on the basis of Prior (1967) became necessary. It was clear that Prior's approach differed quite substantially from the way Reichenbach (1947) treated tense, and tenseless logic was extended with Prior's

machinery. The use of points in time to deal with time structure as expressed in temporal expressions of natural language became known by Montague's work in the seventies collected in Montague (1974). The development of categorial grammar as a syntactic backdrop for semantic interpretation due to his famous paper 'The Proper Treatment of Quantification in Ordinary English' became important in the study of aspectual compositionality because the relation of functional application between two sister nodes made it easier to do formal semantics.

The attempts to ground a temporal ontology led to studies on aspectual classes, for example, Taylor (1977) and Mourelatos (1978). The insight in Bennett and Partee (1978) that points in time cannot be properly used in explained aspectual phenomena promoted the development of interval semantics as used in Dowty (1979). The publication of Dowty (1979) was a major event, because it convinced many people of the potential marriage between a formal semantic machinery and an interesting empirical domain. It was the first real master proof of formal semantics in linguistics.

The birth of generalized quantifier theory in Barwise & Cooper (1981) similarly contributed to the feeling that mathematical logic provided very useful tools for the study of semantic structure. The two frameworks were merged in the study of adverbs of quantification like *always*, *sometimes*, *never* as generalized quantifiers in the temporal domain (De Swart, 1991), and the interaction of temporal and atemporal structure in sentences like *Three girls ate five sandwiches/no sandwiches* (Verkuy, 1993).

In the seventies and eighties the logical properties of intervals were systematically investigated, e.g. by Van Benthem (1983). The rise of event semantics as developed in Davidson (1967) and explored by Kamp (1979, 1980) and Van Benthem (1983) raised the interest of many linguists due to its attractively simple ontology. Event semantics also provided the key to the study of temporal and aspectual phenomena at the discourse level, as shown by Hinrichs (1981, 1986), and Kamp and Rohrer (1983). In this context, the Reichenbachian theory of tense made a comeback. Temporal anaphora became an important topic in the dynamic semantic movement of the eighties and nineties (Kamp & Reyle, 1993; Lascarides & Asher, 1993).

3. MAIN STEPS IN THE DEVELOPMENT

The historical overview of section 2 is extremely brief and leaves out many important contributions, but in general and taken together it shows quite clearly that between (around) 1960 and (around) 1980 three break-through steps were taken for dealing linguistically with temporal phenomena in the broad sense. The first one was the step from tenseless logic to tense logic with points in time. This was done in the sixties but continued into the seventies in all sorts of linguistic work on tense. The step was inevitable: linguistics had been penetrated by tenseless first order logic and so the extension of this logic with temporality found its way into linguistic work.

But it led to difficulties, because the Priorean tense logic is based on points in time, which is not sufficient for the analysis of natural language.

The response constituted the second step; this was the development of interval semantics, in which intervals are allowed as primitives. Bennett & Partee (1978) made it clear that for the aspectual characterization of sentences like *She walked to Rome* it is impossible, or at least very implausible, to assign a truth value to it at a given moment of speech n : one cannot say (as Prior did) that this sentence is true if and only if there is a moment t preceding n such that at t she walk(s) to Rome, the idea being that the event of her walk to Rome took place at t . That cannot be because English speakers would have to say that at t she was walking to Rome. It is not possible to host the event 'She walk to Rome' inside the atomic element t as a whole. If one evaluates the sentence at t it is only possible to say that *She is walking to Rome* is true at t . So, a new notion had to be developed: a sentence may or may not be true for a given interval (Dowty, 1979, 1982; Richards, 1982; Heny, 1982; Van Benthem, 1983).

This second step made aspectuality a serious topic of investigation (Verkuyl, 1972, 1993; Dowty, 1972, 1979; Vlach, 1981; Moens & Steedman, 1987; Krifka, 1989). All sorts of mathematical techniques entered the scene in order to explain the differences between sentences like *Susan walked to Rome* and *Susan walked*. For example, it was argued that if Susan walked then (given some plausible limiting conditions) you can say for any subinterval of the Susan's walk that she walked. The idea is that a walk is sufficiently homogeneous to be considered as consisting of the same sort of substructure. This is not the case in *Susan walked to Rome*: here you cannot go down into the interval itself in order to get a similar structure: no proper subpart of Susan's walk to Rome can be called Susan's walk to Rome.

These sorts of techniques were well-known from set theory (in this case increasing and decreasing monotonicity vs. non-monotonicity), but they were not part and parcel of the linguistic training in the sixties and the seventies. However, thanks to the contribution of mathematical logicians to formal semantics it became normal practice to characterize the difference between the durative aspectuality of sentences like *Susan was afraid* and *Susan walked* (states and processes) and the non-durative aspectuality of sentences like *Susan became afraid* and *Susan walked to Rome* in terms of mathematical structures available from set theory. The interplay between mathematical logicians and linguists was impeccable: all sorts of colloquia were organized to train linguists in using mathematical tools to deal with temporal structure.

The focus on phenomena in interval semantics having to do with homogeneity also made it possible to investigate the structural relationship between the mass and count domain. Mass structure is homogeneous in the sense that if you have water you can take a proper subset of it which also is considered to water. Countable units have a minimum below which they do not count as countable: you cannot take a proper part of a bird which itself can be considered a bird. It is clear that the opposition between mass and count as sketched here is identical or at least quite similar to the opposition between eventualities like states and processes on the one

hand and events on the other. It is also evident that attempts were made to unify the account for both the temporal and the atemporal domains. This line was developed by Ter Meulen (1980, 1985) and Bach (1981). The count domain became secondary in the sense that the mass domain was considered primordial. From the late eighties on, mereology became the technical toolbox for those who underscore the correspondence between the mass and count domain based on the idea that count is a special case of mass structure (Link, 1983; Krifka, 1987, 1989; Landman, 1989, 1991).

The well-known *in/for*-test separating durative and non-durative sentences has been central to the study of aspect:

- (1) She walked for an hour
- (2) #She walked to Rome for an hour.
- (3) ?She walked in an hour.
- (4) She walked to Rome in an hour.
- (5) #She walked a mile for an hour.

A large part of the past forty years has been used to sort out how this test works for Germanic and Romance languages, and which complements of the verb participate in the pattern. In particular, the difference between (1) and (5) and the correspondence between (2) and (5) have received a lot of attention. Moreover, the difference between (6) and (7) has led to systematic research into bare plurality as a factor in aspectual structure:

- (6) #She walked three miles for an hour.
- (7) She walked miles for an hour.

The question is why bare plurals cause an ‘aspectual leak’ into durativity so that *She walked miles* is interpreted as a process, whereas the presence of *three* in (6) makes it possible to interpret *She walked three miles* as an event that can be quantified. That is, if one tries to interpret (6), one is more or less forced to read it as saying that she repeated her three-mile walk an indefinite number of times.

Interestingly, the *for/in* test works out in different ways in different languages. For English and other Germanic languages, it targets what is often called Aktionsart or lexical aspect or aspectual class in the literature (cf. Comrie, 1976; Smith, 1991). In Germanic languages, aspectual class is highly sensitive to predicate-argument structure. In Slavic languages, on the other hand, the *for/in* test seems to correlate with (im)perfectivity, and the relevance of predicate-argument structure is much less transparent (Borik, 2002; Młynarczyk, 2004). The perfective/imperfective contrast depends on affixes on the verb stem, which is generally characterized as grammatical aspect. Languages often combine information about aspectual class and grammatical aspect. In English, the Progressive *-ing* construction pertains to grammatical aspect, but it is sensitive to

the aspectual class of the verb (it combines with action verbs as in *He is singing*, but not easily with state verbs, as in *?He is knowing French*. The division of labor between aspectual class and grammatical aspect is not easy to determine, and has been subject to extensive linguistic investigation and different views (Smith, 1991; Depraetere, 1995; de Swart, 1998; Kabakčiev, 2000).

Of course, attention has also been given to a proper description of adverbials like *for an hour* and *in an hour*. (Verkuyl, 1976; Dowty, 1979; Krifka, 1987; Moltmann, 1991; Higginbotham, 2000; Pratt & Francez, 2001). What do they do? And why is it that they are crucial for the aspectual litmus test? It should be observed though that we have reached the limits of a proper understanding because too little is known about the nature of temporal adverbials in general to be sure about the specific properties of *for*-adverbials and *in*-adverbials. The basic idea about it is that *for*-adverbials quantify in some way — probably some sort of universal quantification is involved — whereas *in*-adverbials either contribute some sort of existential quantification or simply locate the eventuality. The strict blocking of the single event interpretation in sentences like (5) and (6) is not really accounted for by taking *for* as a universal quantifier, because the queer, forced plural interpretation does not follow from it.

The third step led to the domain of what is nowadays generally accepted as the main area of linguistic research involving time: Davidson's (1967) proposal to accept the existence of events as individuals in ontology was fully accepted by formal semanticists at the end of the seventies and early eighties (Kamp, 1979). Event-based semantics provided a clear ontology which fitted easily into the first order logic that had become generally accepted by then in the linguistic community as a way to deal with the logical form of sentences. Event semantics meant an easy extension of the well-known machinery. It became fashionable to quantify over 'eventualities', as they were called by Bach (1981), who used this name to cover the three ontological classes he distinguished (following Mourelatos (1978) and Comrie (1976)): states, processes and events.

The step from interval semantics to event semantics also opened the way for the study of discourse and more importantly for the connection between the study of sentences and the study of texts. It is not very natural to study discourse structure from the point of view of interval semantics. Intervals are typically objects that can be referred to by sentential elements, whereas they cannot be made easily recognizable in discourse, the more so because their role was to enhance the treatment of the truth conditions in tensed sentences. As soon as you work with individuals, you can give them a place in a discourse structure. Along these lines, Hinrichs (1981, 1986) studied the effect of aspectual properties expressed by a sentence on subsequent sentence(s). For example, the difference between (i) *The door opened. The president stood up. He welcomed us and asked us to sit down* and (ii) *The door opened. The president was sitting in his office. He did not see us. He was on the phone* can be understood by assuming that in (i) there were three events following, one after the other, the event described by *The door opened*. In (ii) such a sequence is absent: durative sentences do not create a chain of events; rather they

describe a state or a process going on without any information about the location of the eventuality. The distinction that is often made between Aktionsart or lexical aspect on the one hand, and grammatical aspect on the other evaporates at this level, for lexical states (*He was on the phone*) and progressive sentences (*The president was sitting in his office*) contribute the same discourse instruction, i.e. no progression of the temporal reference time.

Kamp and Rohrer (1983) push this insight even further by making the claim that all sentences in the French Passé Simple (the perfective past tense) introduce events into the discourse representation structure and all sentences in the French Imparfait (the imperfective past tense) introduce states. The mass/count contrast that had become so important in describing aspectual distinctions thus assumes a new life at the discourse level. Note that the emphasis shifts away from truth and truth conditions. The focus of dynamic semantics is on context change and update potential of linguistic expressions. This insight determined the further development of discourse semantics in which the study of tense and aspect has received a central position. In other words, we are now in a situation in which it can be sorted out whether aspectual phenomena are typically restricted to the sentential domain or whether they also contribute to the discourse. And conversely, whether some phenomena are only relevant to discourse structure and some can be seen as sentential.

4. NEW QUESTIONS: CROSSLINGUISTIC VARIATION

In this chapter we have argued that aspectuality can be considered a discipline which has converged towards consensus about the relevant issues, theories and questions in the field and which has developed common terminology and tools required for scientific progress. Given the present contours of the discipline, time is ripe to go beyond and raise issues for further research, formulating new pertinent questions for the domain of aspectuality. One of the important upcoming issues is how to deal with crosslinguistic variation and the possible parameterization of aspect, and, directly related to this issue, the question of how learners acquire aspectuality in various languages.

In order to further refine our theories, aspect data from more languages, especially from those outside the families of Germanic, Romance and Slavic languages, are required. Cross-fertilization between typology and theory can go both ways. On the one hand, additional languages may inform aspect theories about a possibly larger inventory of aspectual categories and other ways of encoding aspectual notions, and, crucially, will establish in more and more detail which elements of aspectuality are universal and which are not. On the other hand, today's theories with their batteries of aspectual tests define the test grounds for new languages and direct which empirical questions should be asked. Methodologies may include studies of single languages, pairs of related or unrelated languages, a variety of unrelated languages, language families and contrastive acquisition studies. Working with the diversity as presented by the world's languages, possibly

collecting data in aspectual-typological databases that are accessible to all linguists, is the next step to take in further aspectuality research.

This is not to suggest that such a crosslinguistic or even typological enterprise is a straightforward affair. Theoreticians need to become clear on the empirical test grounds for their aspect theories. Which tests will be acceptable to all for establishing telicity, which for establishing perfectivity? Which tests are translatable into other languages and yield relevant aspectual insights, and which are not? The difficult status of the *in/for an hour* adverbial test has already been raised above. Moreover, some telicity tests are ‘contaminated’ by the choice of tenses that one uses in the test sentences. For example, in English the telicity test based on the imperfective paradox works perfectly with past progressive and simple past sentences. If you know that *Rick was crying*, you may conclude that *He cried*, whereas if you know that *Rick was building a castle* you cannot be sure that *He built a castle*. If one were to apply this test in other Germanic languages (e.g., Dutch or German), it is unclear which tenses to use, given the lack of a progressive and the fundamentally different aspectual properties of the simple past in these languages. So, before doing crosslinguistic research into aspectuality the question is: which tests can be employed so that one can be sure to carefully compare the same properties across languages?

Crosslinguistic variation raises the fundamental question how much of aspectuality is universal, if anything, and how much of it is language specific. This is a very new question in the domain of investigation and is hardly ever raised so far. This question is extremely important, especially if one wants to develop a theory about the acquisition of aspect or its diachronic development. The tough issue underneath is: how can you tell what is universal about aspect? The answers to this question are far from trivial and need the combined inspiration of theoreticians and typologists. If we find a certain grammatical marking of a particular aspectual distinction in one language, does that imply that it must be listed as a universal distinction that just does not surface as a grammatical category in every language?

A case that can illustrate this point is the category of (im-)perfective aspect. Clearly it is a grammatical category in the Slavic languages as it is encoded morphologically on (nearly) every single verb. Theoreticians may quibble about their analyses of aspect in the Slavic languages, but the real hard question is this: does the category of aspect extend universally to all other languages, even if they do not mark it in such a morphologically pervasive way as the Slavic languages do? The alternative may be to propose semantic parametrization: the parameter for perfective/imperfective aspect can be switched on or off per language, and children and second language learners need to acquire its setting on the basis of the evidence in the input (cf. Smith, 1991; Slabakova, 2001; Van Hout, in press a).

Clearly, the semantic notions of perfectivity and imperfectivity are present in languages that do not encode it with dedicated morphology. Many of the Romance languages have two aspectually different simple past tenses, one perfective, the other imperfective (e.g., in standard Italian the Imperfetto and the Passato Remoto, in Spanish the Imperfetto and the Preterito Indefinido, and in French the Imparfait

and the *Passé Simple*). One may thus conclude that these languages have the grammatical category of aspect and that it gets conflated with the tenses in its formal encoding. But what should one conclude about languages that do not have a (complete or half) perfective/imperfective paradigm, do they have aspect as a grammatical category? Again, the answer seems a straightforward yes, if one analyzes free morphemes in languages, including – to mention two that are presented in this volume – African American English (Jackson and Green, this volume; Terry, this volume), Chinese (Soh and Kuo, this volume), and also Creole languages such as Papiamentu (Andersen, 1990). If aspect is indeed taken as a grammatical category in the languages mentioned so far, the variation one finds may be reduced to a morpho-syntactic parameter: free vs. bounded aspect morphemes. But even in languages without dedicated aspectual encoding, the semantic notions of perfective and imperfective are present, and may be carried by certain tenses. For example, the English Simple Past is considered a perfective tense (Smith, 1991), whereas the Dutch Simple Past is claimed to be neutral between perfective and imperfective (Boogaart, 1999). So maybe aspect is a universal category after all. The point of this little exercise across languages is that our aspect theories need to develop arguments to be able to tell what is universal and what is not.

Other potential alternatives for the crosslinguistic analysis of aspect need to be explored. Possibly there are default mappings of each kind of aspect onto morpho-syntactic or lexical elements in certain domains. Telicity seems to be the kind of aspect that is determined at the level of the VP, whereas grammatical aspect (perfective/imperfective) is associated with aspect or tense projections higher up in the tree. So there would be a natural division into what has been called high and low aspect, where high and low are defined by the syntactic tree. Alternatively, maybe there are no absolute universals, and languages do not all have all the aspects, but there are universal grammaticalization mappings, so that if a language has a certain aspect it will fit in a particular grammaticalization pattern. Yet another possibility is that language variation arises from different ways in which lexical conceptual notions are mapped onto syntax. The field of aspectuality research is getting ready to raise the question about the universality of aspect and explore the options.

5. MORE NEW QUESTIONS: ACQUISITION OF ASPECT

Answers to the questions related to universality and crosslinguistic variation are needed in order to develop aspect acquisition theories to explain the process of first language acquisition by children or second language acquisition by children and adults. In the mid-seventies and eighties many studies have looked at the acquisition of tense and aspect in spontaneous production, and for many languages we have a pretty clear picture which forms children and second language learners first use and by what age or stage of development they do so. It turns out that learners initially use the tenses or aspects (depending on their language) in an atypical pattern, reserving certain tenses or aspects for verbs from certain aspectual classes and not yet generalizing them to all verbs. In English, for example, the Simple Past is

initially mainly used with telic and not with atelic verbs, while the progressive *-ing* morpheme is generally reserved for activity verbs (Bloom, Lifter & Hafitz, 1980), and in French the *Passé Composé* is produced with telic verbs, while actions that do not lead to any result are mainly described in the present (Bronckart & Sinclair, 1973). Similar such skewed patterns have been found in German, Italian, Greek, Polish, Mandarin Chinese, Turkish, Brazilian Portuguese, Hebrew, Japanese and Inuktitut. Seeing these patterns many researchers have argued that children initially form incorrect form/meaning mappings, in particular, that their tense or aspect morphemes carry the semantics of telicity (a lexical aspect notion), rather than the tense or (grammatical) aspect semantics that these morphemes carry in the target languages.

However, these patterns in production are not absolute, but present tendencies (i.e., the Simple Past in English occasionally appears on atelics and *-ing* occasionally on telics), which to some extent reflect similar patterns in the input (Shirai & Andersen, 1995), but not completely (Olsen & Weinberg, 1999). The fact that there are no absolute form/meaning mappings in child language is not expected by theories that claim that lexical aspect is incorrectly carried by the initial tense and aspect morphemes. Moreover, in the languages of the world (that we know of so far) telicity is not typically carried by verbal inflections. So theories that posit incorrect form/meaning-mappings need to explain why child grammars initially posit such an atypical mapping — tense or aspect inflections associated with the semantic notion of (a)telicity — which is not strictly obeyed and will have to be abandoned later on in development.

Questions such as these and the development of novel experimental techniques to test comprehension rather than production have revitalized the interest in the acquisition of tense and aspect since the late nineties. In order to test theories which posit initial incorrect form/meaning mappings on the basis of production data, one can design well-structured experiments that target just those claims and ask children to interpret carefully chosen sentences. This can be done, and is being done with children as young as 2, employing methods such as act-out tasks, picture or movie selection and truth value judgment (Van Hout, 1998, in press a, b; Kazanina & Philips, 2003; Schulz & Wittek, 2003; Stoll, 1998; Vinnitskaya & Wexler, 2001; Wagner, 2001; Weist, Wysocka & Lyytinen, 1991). As it turns out, the hypothesis that early tense or aspect encodes lexical aspect does not seem stand up against the new comprehension data coming in. So the question remains what then determines the skewed production pattern?

More in general, how do learners establish the form/meaning mappings of tense and aspect? Do they associate forms with the right meanings from the moment they start using them, and, if not, what makes them change the form/meaning associations at some point in development? Triggering contexts for learning are few, especially for aspect, since the aspects often present different points of view on the same situation rather than establishing different truth values. There must be some role for Universal Grammar, which may pave the way as to which are possible form/meaning associations, and which are not. But exactly how does Universal

Grammar help the language learner? Questions such as these are only just being asked, and so future research will undoubtedly present new and exiting answers to the acquisition of aspectuality.

6. CURRENT TRENDS AND THEIR VISIBILITY IN THIS VOLUME

The historical overview and new questions raised by typological research and research in language acquisition bring us finally to current trends in the research on tense and aspect. Over the last forty years or so, many different faces of aspectuality have been studied, and different tools have been developed for the proper analysis of a wide range of phenomena. Anyone who has ever taught a seminar on tense and aspect knows that for young researchers in the field, it is not always easy to sort out that toolbox, and find what they need to address their problems. **Verkuyl** (this volume) makes an attempt at surveying the ingredients of aspectual composition. He focuses on the role of the verb and its arguments in the construal of aspectual classes. He also compares different proposals that have been made in this domain, and tries to establish connections between interval-based and event-based approaches. And he compares languages in which aspect is ‘low’ (Slavic) with languages in which aspect is ‘high’ (Germanic) in the syntactic configuration.

As pointed out above, mainstream generative syntax developed an interest in aspectual phenomena in the late eighties. This research was strongly influenced by research on argument structure and thematic roles that clearly had aspectual implications (Borer, 1994; Van Hout 1996, 2000; Levin, 1993; Levin & Rappaport Hovav, 1995; Tenny, 1987, 1994). In the present volume, the papers by Smollett, Di Sciullo and Slabacova, and Folli and Ramchand illustrate this line of work. **Smollett** continues the discussion on aspectual composition from Verkuyl’s article, and focuses on quantized objects that should delimit the event according to standard insights, but don’t do so in certain contexts. The variability in judgments is explained by the claim that objects establish a scale, but do not enforce an endpoint to that scale. Unlike resultatives, goal phrases and particles, objects are not true delimiters.

Di Sciullo and Slabacova (this volume) pick up a different line from Verkuyl’s paper. They discuss the contrast between the expression of aspect in Germanic and Slavic languages in terms of the distinction between D-quantification and A-quantification. But even within Slavic, not all prefixes are the same. Internal prefixes may change the telicity of the verbal projection they are part of, whereas external prefixes do not have this effect. Di Sciullo and Slabacova’s configurational asymmetry hypothesis has empirical consequences for the interpretation of the subject.

Folli and Ramchand analyze the formation of goal of motion interpretation in English and Italian. It is well known that Germanic and Romance differ in the expression of the (located and directed) goal of motion events. Folli and Ramchand locate the characterizing properties of each language in the syntax-semantics interface. Obviously, the relation between form and meaning remains an important

topic in current linguistic research, so we expect more fine-grained analyses along the lines of these papers in the foreseeable future. A better understanding of the lexicon-syntax-semantics interface and typological variation thereof is of major importance to the field in general.

Earlier in this introduction, we referred to the importance of confronting aspectual theory with real data. Di Sciullo and Slabacova underline the relevance of Slavic data in the current theory formation, and go beyond standard views by establishing connections with morphological processes in Romance. Folli and Ramchand also go beyond the standard contrast between Germanic and Romance, and attempt to fine-tune the analysis by looking at individual languages in each class. **Van Geenhoven's** article (this volume) constitutes another example of the current line of combining theory formation with extensive empirical study. Van Geenhoven argues that the overt continuative, frequentative and gradual aspect markers that are found on verbs in West Greenlandic support the view that atelicity is a matter of unbounded pluractionality, that is, plurality in the domain of verbs and events. Bringing in these markers, Van Geenhoven extends the discussion from the domain of inner aspect, to the domain of outer aspect, thereby putting the discussion on adverbial quantification (cf. de Swart, 1991), and mereology (both mentioned above) in a new perspective.

Piñón (this volume) brings in a different class of aspectual adverbs in his study of *completely*, *partly*, *half*. He argues that these adverbs relate events, objects and degrees. Given that verbs do not normally have degree arguments, he introduces measurement functions that create a notion of degree.

Filip (this volume) continues the discussion of plurality and measurement by studying Slavic aspect from the perspective of event semantics. The notion of weak indefiniteness (measure expressions involving something like *many*) is crucial to her analysis of perfective prefixes and bare mass and plural incremental theme arguments. Van Geenhoven, Filip and Piñón all stress the complexity of event structure that arises out of the interaction of predicate-argument structure, grammatical aspect and aspectual markers or adverbs. It is clear that the language data here take us well beyond the traditional aspectual tools. The roads that are explored in these papers suggest that we may expect more work on the enrichment of formal semantics dealing with complex event structures in the years to come.

Language diversity is a strong point of the theoretical proposals made in the papers discussed so far, and the emphasis on typology grows stronger as we move on. **Bach** contributes the most philosophical paper of this volume, by reflecting on the relation between language and culture as far as the classification of eventualities is concerned. Questions concerning ontology and metaphysics are relevant to linguistics as languages exploit the 'abstract' universal underlying model structure in different ways in their lexicon and grammatical systems. Bach uses data from native North American languages to make the claim that language diversity is real, and linguistic theory better deal with it.

Tatevosov's (this volume) paper is in some sense a realization of Bach's ideals, in that it deals with diachronic and typological patterns in a wide range of

languages in an attempt to develop a theory of grammaticalization. Tatevosov studies verbal forms from Nakh-Daghestanian languages (East North Caucasian) that can have both a habitual and a future interpretation, and argues that ability and possibility are crucial notions in the diachronic development. The stage/individual contrast plays a role in this development, because of its interaction with habituality.

Soh and Kuo (this volume) present a study of aspect in Chinese. They show that the perfective marker *-le* indicates completion in some contexts, whereas in other contexts simple termination of the event is also a possibility, even with verbs of creation. They locate the source of the difference in the object. Thus there are clear connections with the work by Smollett (this volume). According to Soh and Kuo, the mass-like character of nouns in Mandarin Chinese allows even more unbounded readings of objects than we find in English.

The last three papers in this volume deal with special aspectual features of varieties of English different from Standard American English. Terry and Jackson and Green study African American English (AAE); Fong's work bears on Colloquial Singapore English. **Terry** (this volume) studies the ambiguity of African American English simple past tense forms between a perfective past tense reading, and a present perfect reading. He reconciles the two readings by positing that the *-ed* morphology in AAE denotes precedence. If *-ed* interacts with a null present tense, it gets an aspectual interpretation (present perfect); if it is the highest tense/aspect marker in the sentence, it is interpreted as past tense.

Jackson and Green (this volume) address African American English from the perspective of language acquisition, focusing on aspectual *be* (a habitual marker). Child speakers need to learn to distinguish aspectual *be* from auxiliary *be* both syntactically and semantically. The production and comprehension experiments carried out by Jackson and Green show that three-year olds still have trouble with the distinction, but four-year olds have acquired the basic uses of *be* in AAE, and five-year olds can use them in combination with negation as well.

Finally, **Fong** (this volume) examines the use of the aspectual marker *already* in Colloquial Singapore English as indicating 'near future', 'just started' and 'ended'. Fong proposes a semantics of *already* in terms of opposing phases, separated by a contextually determined transition point. This allows her to analyze *already* as the emergent unmarked aspectual operator for expressing change of state. An optimality-theoretic analysis with reranking of constraints derives the language-internal and cross-linguistic variation in the expression of the perfect meaning.

The papers in the second half of this volume illustrate that semantically oriented typological research on tense and aspect goes far beyond a mere inventory of forms and global classification of meanings. It usually requires in-depth knowledge of the language(s) at hand, which makes it hard to carry cross-linguistic generalizations beyond a comparison of two or three languages. As pointed out by Bach (this volume), this fact of life is a major impediment to progress in linguistic theory formation. At the same time, we see that the descriptions of temporal-aspectual phenomena in a variety of languages have multiplied in the last decade, and hopefully will continue to grow in the future. More and more, we see that the

descriptions are cast in widely accepted theoretical terms. This makes them empirical test cases for the theories of tense and aspect that have been developed by logicians and linguists, as well as breeding grounds for the development of new analytical tools. This growing tendency of combining very fine-grained analyses of rich empirical data with techniques that build on well-known syntactic and semantic insights will hopefully give rise in the future to a better understanding of both the similarities and differences in form and meaning between languages.

Many more issues could have been – and maybe should have been – addressed in this volume, such as discourse analysis, computational modeling, and implications of linguistic diversity for theories of human cognition. We hope that the papers presented here provide a starting point for anyone interested in broadening the study of tense and aspect.

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ASPECTUAL COMPOSITION: SURVEYING THE INGREDIENTS

Abstract. This paper discusses some of the ways in which the notion of compositionality is understood in the literature. It will be argued that on a strict (Fregean) view a verb has a constant meaning to make in the aspectual composition independently from the information contributed by its arguments, that the VP (verb+internal argument/complement) forms a substantive aspectual unit that should be recognizable as such complex aspectual information; and finally, that aspectual composition forces Discourse Representation Theory into revising the way states and events are taken.

Keywords. Aspectuality, composition, terminativity, DRT, aspectual classes, state, event.

1. INTRODUCTION

The notion of aspectual composition belongs in the wider perspective of developments in two domains of research. The first domain harbours the tradition of the so-called Fregean compositionality. This has been a very important compass in semantics and as the title of my 1971- dissertation *On the Compositionality of the Aspects* suggests, I was guided by it, although I did not have first-hand knowledge of Frege's work at the time. My first contact with Fregean compositionality was via the Katz/Fodor-semantics of the sixties which expressed Frege's ideas on building the complex meaning of phrases and sentences on the basis of their smaller parts. It was that insight of Frege's that—after the collapse of the markerese semantics provoked by Lewis (1972)—turned out to be common ground for the philosophical-logical tradition that took over semantics in the seventies. I have always considered aspectual composition as part of this broader tradition whose major players are well-known: Frege, Russell, Carnap, Quine, Montague, among many others. It makes compositionality a guiding principle in the domain of aspectual phenomena, as it is in other semantic domains. Sometimes the fact that complex units are to be taken as more than the sum of their parts is used as an argument against Fregean compositionality. This objection is wide off the mark. After all, the existence of molecules did not prevent chemistry from looking at atoms as building blocks.

The second domain is linguistic. The notion of aspectual composition hovered already over the literature of the twenties discussed in my dissertation. It grew on trees, as the English proverb says, but the tragedy for my aspectual heroes of the late twenties, Poutsma and Jacobsohn, who in Poutsma (1926) and Jacobsohn (1933) were well aware of the non-atomic nature of aspectual information, was that there were no (syntactic) trees at the time. At the end of the sixties, I could decide

relatively easy that aspectuality should be treated on the basis of amalgamating the meanings of the verb and its arguments into larger units. This was due to the fact that since Chomsky (1957, 1965) the notion of phrase structure had been fully available, whereas it was still absent or at best rudimentary in the twenties and thirties. The idea of aspectual composition started to grow on trees.¹ Phrase structure opens the way to a strict(-er) interpretation of Fregean compositionality.

The thesis that the meaning of a complex expression is computable on the basis of its constituent parts has been attacked in semantic “Gestalt-circles”.² It seems to me that such attacks are too early. To continue the metaphor used above: a molecule is built from atoms by the way these are grouped together. So one cannot do away with Frege without taking into account constructional meanings, context information, or other ways of complementing the information that is present at first sight.

Let me explain this point in more detail with the help of Figure 1 in which the semantic information expressed by the features $[\pm\text{ADDO}]$ and $[\pm\text{SQA}]$ may be taken as semantic atoms. The idea of the picture as a whole is that a Verb is specified for some semantic property, that it takes NP_2 which is also specified for some semantic property, that it forms a VP at which level a complex semantic object is construed, here labeled as $[\pm\text{T}_{\text{VP}}]$, that the VP combines with NP_1 yielding a tenseless sentence S that carries the complex aspectual information labeled $[\pm\text{T}_\text{S}]$ and collected from the lower levels in the form of a complex semantic feature. Then this process comes to an end after which other principles are operative in a higher domain.

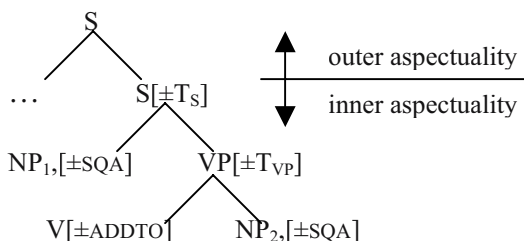


Figure 1. Aspectual composition

To mark this transition a distinction is made between inner and outer aspectuality. The $[\pm\text{ADDO}]$ -property of the verb expresses dynamic progress, change, nonstativity or whatever term is available to distinguish it from stative verbs, which have a minusvalue. The $[\pm\text{SQA}]$ -feature expresses that the NP pertains to a specified

¹ Chomsky's notion of recursivity comes from the same logical tradition that I mentioned earlier, so the idea of composing new complex structures on the basis of simpler ones had also a syntactic underpinning as clearly visible in the Katz/Fodor-semantics.

² Quite fiercely by Lakoff, e.g. in Margolis and Laurence (1999:413) and by some of the prototype theorists included in that collection. An interesting attempt to stick to compositionality in a cognitive approach in which gestalts are clearly recognized is Jackendoff (2002:378–94).

quantity of things or mass denoted by its head noun as in (1a) or contains [-SQA]-NPs as in (1b):

- (1) a. She played *a sonata, three sonatas, some sonatas, a piece of music, that sonata, Schumann's last sonata for piano*
- b. She played *music, sonatas, that (sort of) music, from there to the end*

Contrary to what Dowty (1979:64) said about my position, this distinction has nothing to do with definiteness or indefiniteness. A [+SQA]-NP pertains to something discernible that can be separated from other things and as soon as you can do that, one may count or measure (cf. Verkuyl 1972:59ff.).³ This semantic information is located in the determiner part of an NP.

The process of amalgamating the information contributed by V and its internal argument NP₂ should be different from the process of amalgamating the information expressed by the VP and the external argument NP₁, there being two different levels of phrase structure involved. Part of the difficulty of taking the sum S as more than the sum of its parts is that we know so little yet about the type of information that is collected at the S-level. As I will show below, the relation between NP₁ and VP can be taken in terms of a multiplication relation in which each of the members of the NP-denotation obtains its own VP. Where do we store this particular information? Is it made explicit by the algebraic machinery that computes meanings? Does the fact that there are two ways of multiplication that seem to govern the NP₁ VP-relation, follow from a general cognitive principle? At the present stage we do not yet have answers to these questions, but what we do know is that they are raised by stubbornly following the hard road of Fregean compositionality. It pays off to take this road by trying to compute the meaning of S on the basis of semantic information expressed at lower levels.

Figure 1 provides a simplified scheme for showing how compositionality based on phrase structure operates. The simplification concerns the fact that Figure 1 covers only two-place predicate verbs and one-place predicates with complements. In spite of the drastic reduction, it enables us to ask some relevant questions about how to shape the idea of aspectual composition. I will organize these questions into three main topics.

1. What is the contribution of the Verb to aspectual information?
2. Is the VP an aspectual unit on its own due to aspectual asymmetry?

³ On pages 79ff. discernibility expressed by mass nouns was analyzed in terms of the notion of partitivity: one insulates a part of a larger whole. Krifka's notion 'quantized' can be considered as the mereological explicitation of the [+SQA]-notion, although there are some remarkable differences having to do with NPs like *more than three sonatas*, something, etc. which I consider [+SQA] and Krifka as cumulative and not quantized.

3. How does this asymmetry relate to the DRT-notions of event and state?

The first topic will be discussed in section 2. It focusses on the question of how constant the meaning contribution of a verb should be kept. The second topic, discussed in section 3, concerns the question of how the VP is formed and how it behaves as an aspectual unit in the interaction with the external argument. Section 4 will discuss the question of how aspectual information formed by compositional rules is (to be) given a place in the Kamp boxes of DRT. Their major division between event and state may be disputed on compositional grounds.

2. THE VERB AND ITS ROLE IN ASPECTUAL COMPOSITION

2.1. The constancy of verb meaning

What happens in the composition of the sentences in (2)?

- (2) a. Mary walked three miles
 b. Mary walked miles

In terms of the feature system above, the difference between the VPs *walk three miles* and *walk miles* is accounted for as in (3):

- (3) a. $V_{[+ADDTO]} + NP_{2,[+SQA]} \Rightarrow [+T_{VP}]$
 b. $V_{[+ADDTO]} + NP_{2,[-SQA]} \Rightarrow [-T_{VP}]$

It should be underscored that the features abbreviate information that has received a precise (= formal) second order type-logical characterization in Verkuyl (1993).⁴ In spite of the abbreviatory nature of the features, they help to show that the value of the verb is kept constant in the two cases of (3): it is the complement of the verb that should be held responsible for the different aspectual values of the two VPs that are compared, $[+T_{VP}]$ in the case of the terminative VP *walk three miles*, $[-T_{VP}]$ in the case of the durative VP *walked miles*. The semantic information at the level of the VP differs crucially from the lower-level information. The features also yield a helpful feature algebra part of which is visible in (4).

- (4) a. $[_S \quad \text{Mary} \quad [_{VP} \text{walk} \quad \text{three miles}]]$
 $[+TS \quad [+SQA] \quad [+T_{VP} [+ADDTO] \quad [+SQA]]] \Rightarrow \text{terminative}$
 b. $[_S \quad \text{Mary} \quad [_{VP} \text{walk} \quad \text{miles}]]$
 $[-TS \quad [+SQA] \quad [-T_{VP} [+ADDTO] \quad [-SQA]]] \Rightarrow \text{durative}$

⁴ In Dowty (1979) they are taken as syntactic in spite of the fact that they have always stood for the semantic information explained in section 1.