A THEORY OF ASPECTUALITY

THE INTERACTION BETWEEN TEMPORAL AND ATEMPORAL STRUCTURE

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Preface

The idea that aspectuality, roughly, the property which makes it possible for a sentence to signal whether or not it pertains to something bounded, can be characterized compositionally by a system of rules of interpretation has been around for some time now. However, its articulation appears to be difficult. Not only is it an area of investigation in which several disciplines are deeply involved – linguistics, logic, cognitive science, computer science and philosophy – the phenomena are also very hard to capture because the systematic formal study of temporality as expressed by sentences of natural languages is relatively new. Of course, there is a tradition in which at least a lot of valuable data and generalizations have been made available. However, when it comes to making a theory, soon one is bound to recognize that a lot of preparatory work is to be done before one can even think about theory formation. The picture is also complicated by the fact that the formal semantic study of discourse structure has developed very rapidly in the past ten years, so that all of a sudden all sorts of relatively new factors are drawn into an area of investigation whose scope was mostly restricted to sentences only. A lot of sorting out has to be done against the currents of shifting fashions.

The present study is characterized by a set of restrictive assumptions determining its focus. The first one is that theory formation can be compared with building a house, so there should be some solid ground for its foundations. As set theory has proved to be very solid as the foundation for many sciences, it seemed to me that it might be helpful to use it for a field of study in which quantification over temporal and atemporal entities is central. I have chosen to work in the framework of the Theory of Generalized Quantification, a model-theoretic enterprise which became popular in linguistics through the work of Richard Montague in the sixties and in its current form by the work of Jon Barwise, Edward Keenan, Johan van Benthem, Dag Westerståhl and many others in the seventies and eighties. The second assumption is that the formal machinery of generalized quantification may be compatible with and even incorporate valuable insights of generative grammar, taken here in a broad

sense. For example, the localistic tradition in linguistics has been very important and fruitful for getting an insight into the way change and states are expressed. One of the purposes of this study is to show that localistic insights, as developed in recent work by Ray Jackendoff and in my own work, can be incorporated into standard type-logical representations. In fact this can be done by one elegant formula. In this way, the approach to change in which verbs are taken as dynamically contributing to the build-up of temporal structure is made central. Also aspectual asymmetry as defended in this study is very well compatible with the fundamental asymmetry between arguments of the verb which is inherent to the NP VP distinction in Chomskian syntax.

The third assumption is that one should not start with the roof before the first floor is ready: if terminative aspect, that is, the property of a sentence to pertain to a bounded temporal entity, is built up compositionally, as will be defended, then one should be able to select the proper building bricks and put them together into a certain coherent structure. Starting to construct at a level too high will not do. In other words, a theory of aspectuality based on composition should operate from bottom to top and make sure that it can deal with the basic things before it proceeds to sky high. No attention will be given to aspectuality of texts, in spite of interesting work in this area, such as Kamp and Rohrer (1983), Hinrichs (1986a, 1986b), Partee (1984) and Caenepeel (1989) among others, because so many things need to be done at the lower floors before one may feel safe to proceed. In fact, the present study will be restricted to the study of the interaction between the verb and its arguments, as it was in the papers which form the foundation of the present study, my papers on aspect during the mid-seventies and the eighties. Until recently, I focussed on the formalization of terminative aspect, considering durative aspect as the aspectual 'garbage can', and my original attention was to continue restricting this focus, negation excepted. The formalism of Generalized Quantification Theory (GQT), however, has forced me into being explicit also about all sorts of things which happen to fall under the label of durativity. Subsequently, the present study has also become a theory about large parts of the durative garbage can: it will formally describe at least eight ways in which durativity can be obtained, among which are bare plurality, Progressive Form, habituality, negation, different argument structure, etc.

The fourth assumption is that even though I am very happy with working in an interdisciplinary context, the present theory is fundamentally linguistic even though a lot of logical machinery is being employed. It explains, for example, why I have never liked 'reading-itis', the wish to assign as many readings as possible to a sentence without taking into account that a sentence

might simply be used to underinform and that it is better to provide for means to describe underinformation precisely and formally. It also explains why I did not deal with aspectual matters in terms of scopal change. In my view, the temporal analysis of a sentence like *Two girls dropped a bag* can be given without making an appeal to structures which are paraphrased by 'There is a bag such that two girls dropped it'. Of course, for certain logical purposes scopal change turns out to be very helpful, but as soon as the temporality of sentences is central, all the toy tools of logicians should be reconsidered and not be taken for granted. In this way, the present book also appears relevant for logicians interested in natural language. There are many more assumptions, but these will be made clear while proceeding. Summarizing, this study will concern the principles governing the compositional nature of sentential aspect and the characterization of the semantic factors putting it together.

The book is organized as follows. Part I contains a general introduction to the scope of this study. It also contains an overview of the literature led by the question of how useful the so-called aspectual Verb classes, invented by Zeno Vendler, are for aspectual theory. Part II deals with the (atemporal) quantification expressed by Noun Phrases. It begins with a brief introduction to some key notions of the Theory of Generalized Quantification. The main question raised then is: can this theory deal with the solid aspectual notion of Specified Quantity (roughly, finite cardinality or bounded portion of matter)? It can, but it will be argued that this can be done best at a certain type-logical level assumed for NPs in my 1981 paper 'Numerals and Quantifiers in X-bar Syntax and their Semantic Interpretation'. Not only does such a treatment of NPs give a precise delineation of the notion of Specified Quantity, it also makes it possible to capture a set of phenomena in which NPs, for example, the bare plural, denote an Unspecified Quantity. Moreover, Specified Quantity NPs turn out to have a systematic Unspecified Quantity interpretation, which makes it possible to 'isolate' a well-organized field in the realm of genericity and reassign it to the area of aspectuality: the intriguing phenomenon of definite and indefinite plural and singular 'bareness'. Part II contains a section also including parts of a paper written by Jaap van der Does and myself on the semantics of plural NPs. The PLUG-grammar resulting from this joint work will be used as the basis for a further temporal extension in Part III.

Part III contains a critical analysis of the approach to the logic of change based on Von Wright's analysis, in which change is taken in terms of a transition between two points of evaluation. The main question became: what happened between these two points? This misguiding question was not posed at all

in the localistic tradition mentioned above, to its benefit. This tradition takes change dynamically in terms of construction of temporal structure, thus providing automatically for the fiercely desired answer, the unavailing hunt for which led to a massive turning away at the beginning of the eighties from interval semantics to event semantics. A sketch of the localistic framework based on joint work by Joost Zwarts and myself on Jackendoff's Conceptual Semantics shows that Jackendoff's conceptual syntax can be modelled in terms of set-theoretical notions. Later on, the localistic 'heritage' is translated into the type-logic employed in the extended PLUG-grammar, called PLUG$^+$. Then a critical examination of the contribution of event semantics to aspectual theory is given. It will be rejected as a means to explain aspectual phenomena, not as a means to operate at higher levels of language structure. Furthermore, an analysis is made of the notion of aspectual perspective. It is argued that terminative aspect should be seen as a signal that a sentence is used 'at the rock-bottom of extensionality', so to say. It signals which sort of temporal structure is taken as basic and by this the notion of boundedness is restricted to just one model (i.e. to one time structure). Concomitantly, many forms of durativity signal that a sentence should not be understood with respect to a single model (or domain). Finally, the PLUG$^+$-grammar is developed. It characterizes the aspectuality of a large set of sentences. The grammar covers terminative sentences, a variety of durative sentences, among which are sentences with a progressive form, habituality, partially affected arguments, etc.

The aspectual theory taking shape in the present study has been prepared in a number of articles written between 1974 and 1991. Part of their content has been incorporated, of course, though it turned out to be easier to rewrite rather than simply to copy. However, sometimes it was easier to copy while making some small adaptations. Thus, chapter 2 is a slightly revised and extended version of a part of Verkuyl (1989), chapter 7 contains a part of Verkuyl and Van der Does (1991), whereas a part of Verkuyl and Zwarts (1992) has gone into chapter 10.

Acknowledgments

There are many who I would like to thank for their contribution. First of all, of course, Jaap van der Does and Joost Zwarts. Without them the present study would not have had its present depth and scope. In particular, my work with Jaap van der Does on plurality forced me into deciding on the overall formalism and brought me back to my 1981 paper, which turned out to be very profitable for the analysis of the notion of Specified Quantity. Joint work with Joost Zwarts on Jackendoff's Conceptual Semantics served as a basis for me to draw localism formally into GQT and to make the 'translation' from uninterpreted conceptual structure into type-logical interpretations. As a result, I was able to capture the localistic tradition in one function which is made part of the type-logical GQT-formalism. The present work also includes traces of joint work with Franciska de Jong and Leonoor Oversteegen in the early and mid-eighties, so I would also like to thank them.

A crucial role was played by Kees Vermeulen, our 'home-mathematician' at the OTS, with whom I had a nice deal. For him, going through the present work was part of an enterprise of getting him acquainted with linguistic analyses of natural language. In exchange I had the good fortune of being corrected on the formalism, when it did not do what I hoped it would do or when it did what I did not like it to do. Part of the dynamic machinery of chapter 3 has been given a formal definition as a result of our frequent interaction.

I would like to thank Johan van Benthem, Martin van de Berg, David Dowty, Jan Tore Lønning, Manfred Krifka, Alex Lascarides, Godehard Link and Remko Scha for their comments on the plurality theory, and Nicholas Asher, Hans Kamp, Reinhard Muskens and Ralph Naumann for comments on some of the temporal issues. Johan van Benthem commented on most of my aspectual and quantificational papers. I have stocked up his written annotations and I will now finally give my answers to fundamental questions he raised, so I thank him for asking them. Mentioning Johan nearly automatically involves mentioning Jeroen Groenendijk, Dick de Jongh and Martin Stokhof. This enumeration completes the non-linguistic part of the Gamut quintuple.

Working as one of its members has profoundly influenced the course of my scientific interest. It has (they have!) determined the force with which I have tried to meet the standard of rigorous explicitness. Furthermore, I would like to thank readers of many earlier versions of this book (or of parts thereof), in particular the 'Groningen-group' consisting of Arie Molendijk, Leonie de Smet, Rita Landeweerd, Henriëtte de Swart, Co Vet, Helen de Hoop and Mark Kas. The present book deviates quite drastically from what they had to go through, also due to their detailed criticism. I also would like to thank Frank van Eynde for his insightful comments. On the generative side, I profited from discussions with Peter Coopmans and Martin Everaert on idioms, from my contacts with Ad Neeleman and Fred Weerman on the Complex Predicate Analysis, as well as from a discussion with Gennaro Chierchia. In particular, I would like to thank Johan Kerstens for his critical and detailed comments on the prefinal draft of this book, which he read from the beginning to its (then) end. I can only hope that my critical and detailed comments on the prefinal draft of his book will have helped him as much. All these comments have led to considerable improvements. In this connection, I would also like to thank many of my students. Some of them have already been mentioned, but I would like to add Joyce Bommer and Rini de Jong.

I also thank Adrie Barentsen, Andrej Danchev, Krasimir Kabakčiev, Nel Keijsper, Bozena Rozwadowska, Maaike Schoorlemmer and Maria Stambolieva for discussions about the subtleties of Slavic aspect. Wim Stokhof played an important role by refusing to take the Dutch equivalent of one of the crucial sentences, *Judith ate three sandwiches*, as terminative. Even though I disagree with this observation, it forced me into rethinking some of the fundamental issues that I had taken for granted, and it led me into formalizing the notion of partial affectedness, which had been left implicit in my 1972 thesis. He also was so kind as to organize a small seminar in the Institute for Languages and Cultures of South-East Asia and Oceania at Leyden University, so that the present theory could be put to the test with respect to a number of languages. I thank the participants for providing valuable material.

Finally, my visit to Amherst in the second part of 1986 was an enormous impetus to get this book written. The biannual Amsterdam Colloquia were very important for the development of my aspectual theory. A lecture series at the Bulgarian Academy of Science in May 1989 and lectures at the European Summer School for Language, Logic and Information at Groningen in 1989 and at Leuven in 1990 also helped me very much. I was also happy to participate in workshops organized by Mario and Andrée Borillo from IRIT in

Toulouse in 1990 and 1991. I profited very much from the discussions with the participants in these activities.

The list of acknowledgements is in fact much longer: it includes all those who are mentioned in the papers I have written. I thank them again here.

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PART II: NOUN PHRASE STRUCTURE

I Issues of compositionality

INTRODUCTION TO PART I

The aim of this book is to present a theory about aspectual properties of sentences in natural language. These are properties allowing sentences to express temporal structure with respect to which they are interpreted. Sentences may pertain to states or processes or events, they may express boundedness, duration, repetition, semelfactivity, frequency, habituality, and many other forms of temporality. The question put in its simplest and crudest form is: how do they do this? The answer to this question will be given in terms of the opposition between terminative aspect (roughly, the expression of boundedness) and durative aspect (roughly, the expression of unboundedness). More particularly, it will be given by presenting a theory about the way terminative aspect is compositionally formed on the basis of semantic information expressed by different syntactic elements, in particular the verb and its arguments. It will be argued that an aspectual theory is explanatorily adequate only if it treats the opposition between terminative and durative aspect structurally. The focus of the theory proposed in the present study will be on the interaction between the temporal and atemporal information contributed by constituents involved in aspect construal.

Part I is introductory in the sense that it will try to clarify crucial issues which are involved. In chapter 1, some preliminary notions will be explained, identifying step by step the scope of this study. The provisional picture emerging is that of a simple 'aspectual feature algebra'. The claim is that, on the basis of semantic information associated with specific syntactic elements, it can be predicted whether or not a sentence is terminative. The semantic information associated with the verb (the feature playing a role in terminative aspect construal will be called [+ADD TO] and it expresses (roughly) progress in time) will amalgamate with the semantic information associated with the argument NPs of the verb (the feature involved in terminative aspect will be called [+SQA] and it expresses (roughly) a Specified Quantity of the entities introduced by the head noun of the NP). The use of features is temporary and just for conceptual convenience: it is much easier to give first an overall idea of the aspectual theory by using a sort of informal 'feature algebra', and then proceed by replacing the features by expressions of a standard formal language, as will be done in Part II and Part III.

The compositional approach on the basis of semantic information scattered over constituents in the sentential structure is in conflict with the idea of aspectual classes, such as Vendler's popular verb classes. Vendler (1957) proposed a quadripartition – States, Activities (unbounded processes), Accomplishments