Aspect, tense and modality: theory, typology, acquisition
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Chapter 2
An Outline of Functional Grammar

2.1 INTRODUCTION
In Chapter 1 it was hypothesized that universals in general and implicational hierarchies in particular are reflected in languages of the world as well as in stages of first language acquisition. Is this hypothesis tenable within the domain of TMA? The semantics and pragmatics of these domains have to be established before TMA systems can be compared across languages in the world and across stages of language acquisition. In this thesis, the semantic description of TMA is embedded in the Theory of Functional Grammar, adopting the concept of scope. A TMA expression has scope over the maximal part of the utterance that is modified by that expression. Before the discussion of the domains of TMA in Chapters 3 and 4, the basic principles of Functional Grammar will be discussed in order to understand the concept of scope.

2.2 LEVELS OF ANALYSIS
The Theory of Functional Grammar (from now on FG) has as its aim to describe and explain the grammatical organization of natural languages. It is assumed that the grammatical organization of language is determined by its communicative functions. Accordingly, the basis for the model is constituted by the semantic and pragmatic functions that are universally relevant to languages, even though not every language makes use of the same functions. The model strives to account for the relations between pragmatics, semantics and morphosyntax and therefore tries to describe and define interpersonal communicative functions, semantic representations and expression forms.

In the research on FG, the exposition of the model by Simon C. Dik (1997a; 1997b) has long been the standard. However, in the course of the last decade, many adaptations to the model have been proposed culminating in the introduction of Functional Discourse Grammar (FDG) (Hengeveld 2004a). In FDG the relation between cognitive and communicative factors and linguistic structure is more fully developed. The FDG model starts from communicative intentions and describes linguistic structure at the level of discourse acts. Here,
those aspects of FG/FDG relevant for the present study will be discussed. For the sake of convenience, the term ‘FG’ will be used and not ‘FG/FDG’.

One of the basic principles of FG is that a linguistic expression conveys what the speaker talks about and why the speaker talks about it. An utterance is analyzed at four different levels: an interpersonal, a representational, a morphosyntactic and a phonological level. The interpersonal level accounts for the communicative intentions of the speaker, such as the distinctions between orders and requests, or the communicative acts of reference and ascription. The representational level accounts for the semantics of the communicated content of the utterance that is transferred from speaker to addressee. The structure of this level will be explained in more detail below. Expression rules relate the interpersonal and the representational layer to the morphosyntactic level that contains the language-specific formal elements and templates used to express the semantics and pragmatics. Finally, the phonological level is the interface between the formal structure and the actual articulation.

For this thesis, the representational or semantic level is the essential part of the FG model. The semantic structure of an utterance is subdivided into three hierarchically ordered layers that all serve different communicative functions. Firstly, by producing an utterance, the speaker describes a certain property or relation pertaining to one or more individuals, in other words, an event; the first layer of the semantic structure serves to describe a set of possible events. Secondly, the speaker relates the description of the set of possible events to the specific event the speaker has in mind; the second layer of the semantic structure serves to situate the event in a real or hypothesized world. Thirdly, the speaker transfers propositional content to the addressee; the third layer of the utterance serves to present the content of the speech act (Hengeveld 1989: 130). Expressions of TMA are described as operators that modify the different layers. Different TMA categories apply to different layers, they have different scopes, and consequently, they contribute to different communicative functions. In Chapters 3 and 4 specific TMA categories will be discussed. Here, the different layers at the representational level will be described in more detail.

2.3 THE REPRESENTATIONAL LEVEL

2.3.1 The predicate and arguments
The most basic communicative function that the semantic structure of an utterance fulfils is properly describing a state of affairs (also: event, situation).

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1 See Anstey & Mackenzie (2005) for a thorough background in the development of FG, and Hengeveld & Mackenzie (in prep.) for a full account of the present state of the art.
This is done by the first layer of an utterance that primarily contains two semantic units: predicates and arguments. The predicate designates a property or relation and arguments designate entities involved in the property or relation expressed by the predicate. The description of an event is thus compositional.

Although languages universally have predicate-argument structures, it is language-specific how the predicate and argument slots may be filled to describe a certain real world event. All linguistic elements or lexemes are listed in the lexicon: the language user not only stores the form of the lexeme in question, but also information about the meaning or use and the communicative function for which it may be used. For each lexeme, it is specified how many arguments are involved, i.e., the entities that obligatorily participate in the property or relation designated by the lexeme. This is the quantitative valency of a lexeme. Each argument is labeled with a semantic function, specifying the part that the participant plays in the state of affairs. This is the qualitative valency of the lexeme. The representations of the lexemes read, man and old can illustrate this. See (1):

(1) a. (read) (x₁)Agent (x₂)Patient
   b. (man) (x₁)Ø
   c. (old) (x₁)Ø

The verbal lexeme read describes the relation between two arguments; one argument (x₁) has the semantic function Agent—the participant that reads—and the other (x₂) has the semantic function Patient—the participant that is read. Both the nominal lexeme man and the adjectival lexeme old describe properties of only one argument (x₁). This argument has the semantic function Zero, which means that the participant is primarily involved in a state. In 1b the participant has the property ‘man’ and in 1c it has the property ‘old’.

Second, the categorical status, verb, noun, adjective or adverb, is stored for each lexeme, which serves as information about the possible communicative functions for which the lexeme may be used. For example, different lexemes can be used predicatively. In the sentence The man reads a book, the verbal lexeme read is used as the predicate; in he is president the nominal lexeme president is used as the predicate; in the man is old the adjectival lexeme old is used as the predicate; and in she is here the adverbial lexeme here is used as the predicate. In addition to the predicative use, different lexemes or parts of speech have specific, distinguishing communicative functions. Without any modification, the function of a verbal lexeme is only predicative: it always designates a property.

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2 There is some variability in the valency of lexemes: for example, write in English may be used as a one-place predicate I’m writing or a two place predicate I’m writing a letter and there may also be a third participant, I’m writing a letter for John.
or relation that is ascribed to one or more arguments. Besides the predicative function, only a noun can be used with a referential function, to refer to an individual or a more abstract entity, such as the man is old. Adjectives and adverbs may be used for modifying, in addition to their potential predicative function: an adjective can be used to modify a nominal head and an adverb to modify a non-nominal head (Hengeveld 1992).

Depending on the event he tries to describe, the speaker chooses lexemes from the language-specific lexicon to serve as the predicate, designating the central relation or property in the event that is ascribed to a specific number and type of arguments. The speaker also chooses lexemes (or more complex constructions) that designate the entities that participate in the relation or property. In FG, the description of the event is formalized as in (2):

\[(f_1: \text{Lexeme}_0) (x_1: \text{Lexeme}_0)^n\]

in which \(f_1\) is the variable used as a symbol for the main predicate; the colon can be read as 'such that'; \(\beta\) stands for the categorical status of the lexeme, verb, noun, adjective or adverb; \((x_1)^n\) represents the required number and type of arguments. Arguments can be concrete individuals, such as John, the dog, or the book, but also abstract entities, such as the meeting, the idea or the question. In fact, the first layer of the semantic structure does not describe a specific event, but it describes a set of possible events. The description of the event at the first layer is not related to the real world; it is not specified which concrete event in the real world the speaker has in mind.

Speakers thus use different semantic units to construe a proper description of a set of possible events. In addition to the predicate (\(f\)) and the arguments (\(x\)), there may be units designating non-obligatory participants (adjuncts), for example with the role beneficiary, company or instrument, or properties of the event, such as the direction or path of an event. See (3):

\[
\begin{align*}
\text{a. Diana}_1 \text{ is buying}_2 \text{ a present}_2 \text{ for Margaret}_3 \text{ beneficiary} \\
\text{b. I went}_1 \text{ to Paris}_2 \text{ with John}_3 \text{ company} \\
\text{c. I}_1 \text{ want to write}_1 \text{ a letter}_2 \text{ with a feather}_3 \text{ instrument} \\
\text{d. Peter and Angie}_1 \text{ will cycle}_2 \text{ to France}_3 \text{ direction} \\
\text{e. He}_1 \text{ drove}_1 \text{ through the tunnel}_1 \text{ path}
\end{align*}
\]

³ Verbs need to be made a noun (nominalization) before they can be used to refer, such as in English by adding -ing fishing or eating as the name of the activities.
2.3.2 The predication

The speaker not only describes a set of possible events in an utterance. He also relates the description of this set of events to the concrete event he has in mind. The second communicative function of an utterance is thus situating the event. The semantic unit in an utterance that accounts for the function of situating the event is the second layer, that contains the **predication**. The predication designates an event and is symbolized by the variable ‘e’. This event e can be located in space, time or actuality. An illustration of the underlying structure of the predication is presented in (4) for ‘The old man reads a book’:

(4) \[ e: [(f: \text{read}) \ (x_1: \text{man} \_N : \text{old} \_A)_{\text{Agent}} \ (x_2: \text{book} \_N)_{\text{Patient}}] \]

‘The old man reads a book’

The predicate read provides two argument slots. The argument slot (x_1) \_Agent is filled with *the old man*, that itself is built up by the nominal lexeme *man* and the adjectival lexeme *old*. The argument slot (x_2)\_Patient is filled with *a book* that itself is construed on the basis of the nominal lexeme *book*. The predication, the semantic unit at the second layer, is thus construed by the semantic units of the first layer, the predicate, arguments and, potentially, adjuncts.

2.3.3 The proposition

Besides describing and situating, a speaker also transmits content to the addressee. In FG, the third layer of the underlying representation of an utterance serves to express the transferred content of the utterance. The semantic unit at this layer is the **proposition** that designates a potential fact or propositional content. A propositional content exists only in the mind of the speaker contrary to an event, which is part of the external world and exists independently of the speech act and speaker. A propositional content can be evaluated in terms of truth and the speaker may denote his personal attitude towards the propositional content. The proposition is represented by the variable ‘p’, which is restricted by a predication. Consider (5):

(5) \[ p: [e: [(f: \text{Pred}) \ (x_1)_{\theta}]] \]

Each layer of the underlying representation is provided with a specific variable that symbolizes the entity designated at that layer: at layer 1 the variable \( f \) is used for the description of a property or relation and \( x \) for arguments, at layer 2 the variable \( e \) is used for the event and at layer 3 the variable \( p \) is used for the propositional content. The variables thus represent semantic units designating a certain type of entity. A simplified representation of the layers is presented in
Table 2-1. It is important to note that semantic units at lower layers form part of the semantic units at higher layers: the predicate and arguments form part of the predication and the predication forms part of the proposition. As a result the designated entities are more abstract and the semantic units are more complex at each next higher level.

Table 2-1. Underlying structure of the layers

<table>
<thead>
<tr>
<th>Linguistic unit</th>
<th>Structure</th>
<th>Function</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicate + arguments</td>
<td>(f₁:Pred₁)(x₁)⁰</td>
<td>Describing</td>
<td>Relation / property + participants</td>
</tr>
<tr>
<td>Predication</td>
<td>[e₁:(<a href="x%E2%82%81">f₁:Pred₁</a>⁰)]</td>
<td>Situating</td>
<td>Event</td>
</tr>
<tr>
<td>Proposition</td>
<td>[p₁:[e₁: (<a href="x%E2%82%81">f₁: Pred₁</a>⁰)] ]</td>
<td>Presenting content</td>
<td>Propositional content</td>
</tr>
</tbody>
</table>

The underlying semantic representation of an utterance in FG is thus based on the communicative functions that the utterance fulfils and its semantic designations. The semantic units are universal, that is, the predicate, the predication and the proposition can be expressed in any language, but each language has its own set of lexical and grammatical elements that may be used to build up the units.

2.4 MODIFIERS

The representational level of an utterance thus consist of layers that serve the functions of describing a set of possible events, situating the event and presenting the content of the utterance. Semantic units that designate different entities fulfil these functions: at the first layer, the predicate (f) designates a property or relation and arguments (x) designate the individuals that participate in the property or relations; at the second layer, the predication (e) designates a state of affairs; at the third layer, the proposition (p) designates the content of the utterance. Layers should be considered as semantic rather than syntactic units.

The designated entities at each layer of the semantic structure can be further modified by lexical or grammatical elements such as adverbial constructions, periphrases, inflection, particles or auxiliaries. The distinction between grammatical and lexical elements will be discussed in more detail in 5.2 and 6.2.1. For now, it suffices to say that the boundary between lexical and grammatical elements is not absolute, but rather a continuum ranging from purely lexical to purely grammatical elements. Grammatical modifiers have a general, often abstract, meaning and lexical modifiers a specific, often concrete,
meaning. For example, the grammatical expression of past tense in English, \(-ed\), indicates that the event is temporally located before the moment of speech, whereas lexical expressions of past time, such as \(yesterday\), \(two\ days\ ago\) or \(in\ 1907\), indicate much more specifically when the event actually took place. Grammatical modifiers are called \textit{operators} in FG and are represented by the symbol \(\pi\) in the semantic representation; lexical modifiers are called \textit{satellites} and represented by the symbol \(\sigma\). Grammatical expressions of TMA, the subject of this thesis, are thus grammatical modifiers, formalized as operators.

Modifiers contribute to the communicative functions of description, situating and presenting content, by modifying the semantic units and therefore specifying the designated entity of a semantic unit. The classification of modifiers in FG is primarily based on the scope of their modification, with which is meant the maximal semantic unit that is modified by the operator or satellite. The target of modifiers can be the property or relation designated by the predicate, the event designated by the predication or the propositional content designated by the proposition. Arguments can also be modified, but that is not relevant to this thesis and will not be discussed further. Modifiers are labeled with the number of the layer to which they apply: \(\pi_1\) and \(\sigma_1\) for grammatical and lexical modifiers of the predicate at the first layer, \(\pi_2\) and \(\sigma_2\) for modifiers of the predication at the second layer and \(\pi_3\) and \(\sigma_3\) for modifiers of the proposition at the third layer. A complete semantic representation of an utterance with its modifiers is presented in Figure 2-1.

\begin{align*}
\text{Predicate and arguments:} & \quad (f: \text{Pred}_0) (x_1)\ldots(x_n) \\
\text{Modification of predicate:} & \quad (\pi_1 (f: \text{Pred}_0) \sigma_1) (x_1)\ldots(x_n) \\
\text{Predication:} & \quad e: [(\pi_1 (f: \text{Pred}_0) \sigma_1) (x_1)\ldots(x_n)] \\
\text{Modification of predication:} & \quad (\pi_2 (e: [(\pi_1 (f: \text{Pred}_0) \sigma_1) (x_1)\ldots(x_n)]) \sigma_2) \\
\text{Proposition:} & \quad [\pi_2 (e: [(\pi_1 (f: \text{Pred}_0) \sigma_1) (x_1)\ldots(x_n)]) \sigma_2] \\
\text{Modification of proposition:} & \quad (\pi_3 (\pi_2 (e: [(\pi_1 (f: \text{Pred}_0) \sigma_1) (x_1)\ldots(x_n)]) \sigma_2)) \sigma_3
\end{align*}

\textbf{Figure 2-1.} Semantic representation of the clause in FG

Each language has its own set of expression rules that translate the underlying semantic representation into an actual linguistic expression. At the
point of translation morphosyntax comes into play. From a functional perspective morphosyntax is primarily a means to express semantics and pragmatics. Every detail of the syntactic organization of a language should thus have an underlying semantic or pragmatic explanation in the model of the utterance that accounts for these syntactic features or there should be general cognitive factors that explain the syntax.

This thesis is restricted to grammatical modification by \( \pi_1 \)-, \( \pi_2 \)-, and \( \pi_3 \)-operators. They will be referred to as predicate or \( \pi_1 \)-operators, predication or \( \pi_2 \)-operators and proposition or \( \pi_3 \)-operators. Notice in Figure 2-1 that (modified) semantic units of lower layers fall within the scope of semantic units at higher layers. Consequently, operators at lower layers fall within the scope of operators at higher layers. Note furthermore that several modifications may apply at the same time to the same semantic unit, so that operators at the same layer may have scope over each other. Scope relations between operators are thus not an a priori argument for locating those operators in different layers. The location of specific categories at a certain layer is entirely determined by its semantic contribution to the utterance.

How is the function of predicate operators defined? In Hengeveld's definition (1989: 133) predicate operators (\( \pi_1 \)) contribute to 'building up a proper description of the situation the speaker wishes to refer to.' This is correct, but it is only a specific part of the event description that is influenced by predicate operators, that is, the designated property or relation. Predicate operators do not influence the designated participants or additional participants. The description of the participants can be modified but this does not influence the description of the predicate. The proper description of a state of affairs is thus established compositionally by the elements at the first layer: a (modified) predicate, (modified) arguments, and possibly, (modified) additional participants. I adhere to Hengeveld's approach (1989) that this description of the event cannot be further modified as a whole, contrary to the position of Dik (1997a) and Cuvalay-Haak (1997). A predicate operator (\( \pi_1 \)) is thus a grammatical expression that changes the description of the property or relation that is ascribed to the argument(s), without modifying the description of the arguments itself. A \( \pi_1 \)-operator interacts with the semantics of the lexeme that designates the property or relation. The resulting complex property of relation is then applied to the arguments. Chapters 3 and 4 will show that the categories aspect, property quantification, and certain modal categories, such as ability and volition, are to be classified as \( \pi_1 \)-operators.

Predication operators (\( \pi_2 \)) contribute to the situating function of the predication, they 'relate the description of a [state of affairs] to the occurrence of that [state of affairs] in a real or imaginary world.' (Hengeveld 1989: 134). In Dik's formulation (1997a: 218) \( \pi_2 \)-operators 'leave the internal constitution of
the [state of affairs] intact, but either quantify it or locate it with respect to spatial, temporal and “objective” cognitive dimensions.’ In the next two chapters the semantic categories tense, irrealis, event quantification and certain modal categories are shown to be $\pi_2$-operators.

Proposition operators ($\pi_3$) contribute to the presentation of content, by evaluating this content. They specify how much responsibility the speaker takes for the propositional content or how reliable the speaker estimates that the proposition is, by indicating his personal attitude towards the proposition, his commitment to the truth of the proposition or the source of evidence he has for the proposition. In Chapter 4, it is shown that the categories of evidentiality and certain modal categories function as $\pi_3$-operators.

This thesis is restricted to operators at the representational level in FG. There are also modifiers that operate at the interpersonal level (2.2), and that express, among other things, the basic illocution of an utterance (declarative, interrogative), politeness strategies or discourse structure (finally, in short). These modifiers fall outside the scope of this thesis.

2.5 THE SCOPE HIERARCHY

As discussed above, FG analyzes an utterance as serving different communicative functions at the same time. The first layer fulfills the function of describing a set of possible events. The semantic units at this layer are the predicate and the arguments and possibly adjuncts. The predicate designates a property or relation and the arguments designate entities that participate in the property or relation. Predicate operators ($\pi_1$) have scope over the predicate only. They contribute to the description of a state of affairs by specifying additional features of the property or relation. The second layer fulfills the function of situating the event. It relates the description of the set of possible events to a concrete event in a real or imaginary world. The semantic unit at this layer is the predication that designates the event. Predication operators ($\pi_2$) have scope over the predication. They specify the setting and occurrence of the event, by situating the event in time or actuality or expressing the frequency of occurrence of the event. The third layer fulfills the function of presenting the propositional content. The semantic unit at this layer is the proposition that designates a propositional content. Proposition operators ($\pi_3$) have scope over the proposition. They are concerned with expressing the speaker’s personal attitude or commitment towards the propositional content (Hengeveld 1992: 130-32).

According to the model of FG, lower layers in the semantic representation form part of higher layers, which makes the relation between the layers hierarchical. Each higher layer contains a more complex semantic unit that
designates a more abstract entity. Operators like TMA expressions apply to different layers and also stand in a hierarchical relation to each other, since operators at higher layers have scope over all lower layers, including their operators. As a consequence, operators at each higher layer modify a more complex semantic unit ranging from a predicate to a predication to a proposition, that specify increasingly abstract entities, from properties or relations (π₁) to events (π₂) to propositional contents (π₃). The function of operators at each higher layer thus seems to be cognitively more complex.

Furthermore, the function of operators at each higher layer seems to be communicatively less motivated, that is, they present more redundant information. The function of π₁-operators is most basic or motivated. In most utterances, the property or relation ascribed to the arguments is important new information and the modification of this property or relation by π₁-operators is crucial to an adequate description of the event. π₁-Operators contain information that is so specific that it cannot be predicted or inferred from context and it needs to be expressed linguistically. The function of π₂-operators, modifying the relation of the event to the real or imagined world, is also a basic communicative function, but here, the context often helps the addressee to infer the temporal or spatial location, the actuality, or the frequency. This means that π₂-operators more often than π₁-operators present redundant information. Finally, the function of π₃-operators, modification of the propositional content, seems to be communicatively least motivated: π₃-operators provide the speaker’s evaluation of the content, but in many utterances, the expression of the speaker’s evaluation is not relevant. It is a conversational maxim that the speaker is committed to the propositional content: only when this is not the case or when the commitment of the speaker is somehow special, the speaker’s evaluation has to be encoded linguistically.

It is thus assumed that if their scope is wider, operators are cognitively more complex and communicatively less needed. In other words, operators with wider scope have more marked functions than operators with narrower scope, according to the Scope Hierarchy in (6):

\[ \pi_1\text{-operator} \subset \pi_2\text{-operator} \subset \pi_3\text{-operator}, \]

in which ‘⊂’ stands for ‘is less marked than’.

It is expected that the Scope Hierarchy is reflected in TMA systems of the languages of the world and in stages of first language acquisition. In Chapters 3 and 4 it will be investigated how specific TMA domains should be understood in terms of scope. In Chapter 5 hypotheses will be formulated on how the Scope Hierarchy will be reflected in the variation of TMA domains in adult languages and child languages.