FYI : theory and typology of information packaging
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The present chapter presents **Functional Discourse Grammar** (FDG), the framework in which the research was carried out. Section 4.1 gives a global overview of the framework, discusses some of its defining characteristics and gives a very brief historical background that highlights the differences between it and its predecessor, Dik’s better-known **Functional Grammar** (FG). The next two sections discuss FDG in more detail, whereby section 4.2 is concerned with the static components of the model, whereas section 4.3 introduces the dynamic processes that connect them. In section 4.4, some concluding remarks are made.

### 4.1 Overview

#### 4.1.1 Global position of FDG

Functional Discourse Grammar can be classified as a formalising, structural-functional pattern theory of language.

**Structural-functionalist theories of language.** The notion of structural functionalism in its classificatory sense is coined in Butler (2003). What sets structural-functional theories of language apart from other theories is their view on autonomy, the notion that is generally accepted to underlie the traditional opposition between formalist and functionalist approaches. Autonomy breaks down in two separate issues, which will here be termed ‘domain’ and ‘level’. As regards the former, Newmeyer (1998) argues that assumptions about autonomy concern three distinct parts of the human language faculty. **autoknow** relates to the autonomy of Grammar with respect to its use in
communication; autogram relates to the autonomy of Grammar with respect to other cognitive systems; autosyn relates to the autonomy of morphosyntax with respect to other subsystems of Grammar. With respect to the mutual autonomy of such subsystems, Croft (1995) argues for distinguishing three implicationally related levels of autonomy. The lowest level is arbitrariness. A target is arbitrary with respect to a source when its structure cannot be predicted from the structure of the source. The next level is systematicity. A target is systematic when its units form “a set of interlocking regularities ...that holds together overall” (Croft 1995: 495). The final level is self-containedness. A target is self-contained when the systematic rules that govern the generation of its structure do not make reference to things external to the target. Croft’s levels of autonomy are used in Table 4.1 to derive three qualifications for linguistic systems. autonomous systems, which are self-contained and arbitrary; integrated systems, which are arbitrary, but not self-contained; and heteronomous systems, which are neither arbitrary nor self-contained.¹

<table>
<thead>
<tr>
<th></th>
<th>Self-contained</th>
<th>Arbitrary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Integrated</td>
<td>−</td>
<td>+</td>
</tr>
<tr>
<td>Heteronomous</td>
<td>−</td>
<td>−</td>
</tr>
</tbody>
</table>

Table 4.1 Levels of autonomy, after Croft (1995)

These three labels can be applied to Newmeyer’s (auto)syn and (auto)gram, which yields nine logically possible views on the combined autonomies of Grammar with respect to the rest of the cognitive system and morphosyntax with respect to other linguistic modules. This is illustrated in Table 4.2.² As can be seen there, structural-functionalist theories occupy the centre of this classification. They adhere to an integrationist view on syntax: while believing syntax (or more generally, surface structure) to be arbitrary with respect to other subsystems of the human language faculty, they advocate that syntax is not self-contained, and that the generation of syntactic structures relies heavily on their semantico-pragmatic motivation. That is, much of syntax can and should be given a functional explanation. Likewise, while they assume that Grammar has its own arbitrary rules and primitives, structural-functionalist theories argue that the occurrence of such

¹It is implicit in Croft (1995) that systematicity is not a necessary feature to classify linguistic theories. It has been omitted for reasons of simplification.
²The table adopts Croft’s labels for classes of linguistic theories, except structural-functionalism which originates from Butler (2003). A full discussion of the entire table is beyond the scope of this study: the four classes mentioned here present a non-exhaustive classification, and many more subtle subdivisions are possible. As regards the existence of heteronomist approaches to Grammar, Croft (1995: 492) notes that such theories are not attested.
structures is triggered by extralinguistic communicative intentions, and constrained by cognitive principles that exceed the language faculty. Hengeveld and Mackenzie (2006: 669) formulate it as follows: “An FDG will succeed to the extent that it clarifies the relation between the instrumentality of the language system in creating and maintaining communicative relationships... and to the extent that it obeys general cognitive restrictions on the production and interpretation of discourse”.³

<table>
<thead>
<tr>
<th>SYNTAX</th>
<th>GRAMMAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomist</td>
<td>contemporary formalism⁶</td>
</tr>
<tr>
<td></td>
<td>external functionalism⁷</td>
</tr>
<tr>
<td>Integrationist</td>
<td>structural functionalism</td>
</tr>
<tr>
<td>Heteronomist</td>
<td>extreme functionalism⁸</td>
</tr>
</tbody>
</table>

³For instance, the Minimalist Program (Chomsky 1995).
⁶For instance, the Cartographic Approach (Cinque 2002).
⁷For instance, Emergent Grammar (Hopper 1987).

Table 4.2 Macrotypology of linguistic theories, based on autonomy of syntax and Grammar

Formalising vs. non-formalising theories. Functionalist and formalist theories of language differ with respect to their take on autonomy. However, as Hengeveld (1999: 93) points out, there is another opposition implied in these labels. It concerns the question whether a theory has, in the words of Hengeveld, “the explicit aim of constructing a formal representational system”, that is used as a metalanguage to talk about the object language. The strictest form of such a system would be a fully explicit symbolic apparatus where every symbol and every relation between symbols has one invariable interpretation. The weakest form would be a theory that does not use any metalanguage at all, but relies on the object language itself to operationalize its beliefs. Hengeveld proposes calling these two extremes formalising and non-formalising approaches; as will be seen when the FDG formalism is discussed in section 4.2.2, Functional Discourse Grammar belongs to the former class.

³There is considerable divergence among structural-functionalist approaches with respect to the level of autonomy of Grammar. Within FDG, Hengeveld and Mackenzie (2008) take a moderate integrationist view, while García Velasco (2007) takes a much more heteronomist stance, arguing that non-linguistic cognitive considerations interfere directly with Grammar at some points.
Pattern vs. process theories. In the discussion of autonomy, Newmeyer’s domains *autosyn* and *autogram* were used to characterize the position of structural-functional theories with respect to this issue. Now, let’s turn to *autoknow*, which differs from the other two in that it is not concerned with the relative autonomy of symbolic systems with respect to each other, but rather with the (in)separability of “competence (the knowledge required for some activity) and performance (the actual implementation of that knowledge in the activity)” (Dik 1997a: 5, emphasis mine). This distinction is a decisive factor in limiting the explanatory burden of linguistics. That is, if *autoknow* is refuted, linguistic expressions must be taken ‘at face value’ in their entirety. This entails that all kinds of phenomena which we do not want to intrude in our account of Grammar because they clearly belong to the triplet transmitter-channel-receiver rather than to the message (Shannon and Weaver 1949) itself can no longer be shut out, but have to be taken into account. On the other hand, theories critical of *autoknow* have rightly pointed out that the competence-performance distinction, while not a priori untenable, is often applied haphazardly without due concern for methodology, and is abused to discard ‘perfectly linguistic’ phenomena that happen to be incompatible with the researcher’s assumptions.

Although it is implicit in Butler (2003: 4-5) that he considers *autoknow* to be incompatible with the structural-functionalist ambition to provide functional explanations of linguistic structure, the refutation or acceptance of it is not a defining characteristic of structural-functional theories. Systemic Functional Grammar (Halliday 1994) refutes *autoknow*, while Role and Reference Grammar (Van Valin 2005) remains agnostic. On the other hand, Functional Grammar (Dik 1997a) and Functional Discourse Grammar (Hengeveld 2004: 366) embrace *autoknow*. Hengeveld refers to the distinction between *pattern models* and *process models* of linguistics, stressing that in his opinion, FDG belongs to the former category. He states that “in FDG, as in FG, the patterns of language are described as reflecting the process of communication. This, however, does not mean that FDG is a model of that process”. This view has become institutionalized in Hengeveld and Mackenzie (2008). FDG considers the whole of the NLU’s communicative competence to be relevant to the explanation of surface structure differences; only those phenomena are excluded that can convincingly be argued to be a result of unconscious, uncontrolled, unpremeditated internal and external disturbances of the process of articulation.

### 4.1.2 Defining characteristics

The defining features of Functional Discourse Grammar follow from what has been said in the previous section with regard to its position among other theories. I will briefly list them below.

**Language as a means of communication.** The central assumption in FDG is that differences in surface structure are primarily motivated by the desire of the language user to be successful in his communication. This is not taken to imply that all of
surface structure is immediately dependent on semantico-pragmatic considerations: since it is discrete, exhaustive and incremental, the presence of (partial) structure generated earlier may restrict the options available at a later stage. Nevertheless, functional explanations are very prominent. The centrality of functional explanations is reflected by two aspects of the model: separate, well-developed systems within Grammar for the description of semantic and pragmatic categories as triggers for morphosyntactic and phonological-prosodic structure (levels of representation), and the embedding of Grammar in a larger cognitive apparatus (consisting of components) that deals with aspects of communication that go beyond verbal communication.

**Neither Grammar nor syntax self-contained.** Functional Discourse Grammar rejects the idea that either syntax or Grammar as a whole are self-contained. Instead, it stresses the fact that Grammar is embedded in and informed by a wider cognitive apparatus providing a theory of communicative competence, while syntax is embedded in and informed by Grammar. This is reflected in the top-down architecture of the model, in which the generation of surface structure is driven by semantico-pragmatic considerations, but is ‘immediate’ in the sense that steps in the generation may be skipped if they are irrelevant to the construal of the utterance at hand. This architecture also aspires to have psycholinguistic relevance, in that it is compatible with theories about language production and processing, and diachronic relevance, in that it provides a functionally driven perspective on language change.

**Centrality of functional units.** Because of its top-down architecture, Functional Discourse Grammar aspires to take semantico-pragmatic units as its explananda, and not morphosyntactic units. In particular, it rejects the centrality of the sentence, and instead takes the discourse act as its central unit of analysis. While a prototypical act patterns with the semantic unit propositional content and the morphosyntactic unit clause, this is not necessarily the case. One of the corollaries of this belief is a natural preoccupation with larger stretches of surface structure material, since Acts can only be studied in the discourse context in which they appear.

The centrality of functional units notwithstanding, FDG takes surface structure very seriously. It is, as Hengeveld and Mackenzie (2008: 39) put it, “a form-oriented ‘function-to-form’ theory of language, in providing ... an account of only those interpersonal and representational phenomena which are reflected in the morphosyntactic or phonological form”.

**Centrality of diversity.** Functional Discourse Grammar considers linguistic variation in its widest sense to be of central importance. Under the assumption that the architecture of human cognition as a whole is language-independent, language diversity gives crucial information about the structure of the human language faculty, because it tells us how non-discrete cognitive distinctions are mapped onto
discrete semantico-pragmatic and morphosyntactic categories. While the study of intralinguistic and diachronic variation is still somewhat underdeveloped, the study of typological variation takes up a large part of the work done in FDG.

The importance of diversity is reflected in the theory’s strongly lexicalist\(^4\) orientation. Grammar is thought of as a minimal algorithm that operates on the basis of a limited number of highly abstract rules. The primary source of variation is the input to these rules, which is modelled in terms of structural primitives (frames) and contentive primitives (lexemes) that are taken from the lexicon. Typological differences can hence be explained in terms of the availability of input elements and their (implicational) distributions. Also, the lexicalist approach in Functional Discourse Grammar is in line with Haspelmath’s (2007) observation that typologically adequate theories should be non-aprioristic, in the sense that theoretical assumptions (such as pre-established syntactic categories) should not a priori confine the possible surface structures that such a model can generate.

**Rigid formalization.** In Functional Discourse Grammar, the role of Grammar in verbal communication can be seen as a funnel that is used to convert non-discrete communicative intentions to discrete surface structure expressions in a way that optimally facilitates interpretability by the Addressee. The bulk of this process is reflected in the model by the presence of a context-sensitive formulator that converts extralinguistic communicative intentions to orthogonal sequences of semantic and pragmatic structure. An encoder converts these underlying functional structures to morphosyntactic and phonological structures, which feed into the articulatory systems outside Grammar.

It is tacitly assumed that all structures within Grammar consist of discrete building blocks. This is reflected in the adoption of a rigid formalism in which every element and every interaction between elements is understood as a symbol with an invariable meaning.

**Pattern and Speaker perspective.** Functional Discourse Grammar aims to model patterns in linguistic structure, rather than the processes generating those patterns. This is reflected by the theory’s strong emphasis on the static outcome of processes within Grammar (modelled as levels of representation), while the processes themselves as they take place in the interfaces remain wholly unspecified.

Second, despite its aspiration for full communicative adequacy, FDG takes a Speaker perspective on Grammar. While the theory provides a pattern model and not a production model of language, this still poses some problems for the representation of aspects of language that are strongly interaction-oriented.

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\(^4\)The FDG lexicon is not a lexicon in the traditional sense, but rather a fund – as indeed it used to be called in Functional Grammar – of primitives on the basis of which the rules in Grammar operate.
4.1.3 FDG and FG

Historically as well as conceptually and notationally, Functional Discourse Grammar is an extension of Dik’s Functional Grammar (Dik 1978, 1989, 1997a), albeit one with two critical changes with respect to the original.\(^5\)

Most importantly, FDG differs from FG in that it implements the awareness that pragmatic and semantic structure, while being in a dependent relationship, do not always necessarily run in parallel, and should therefore be analysed separately. This is not possible in Functional Grammar, because it contains only a single level of underlying functional structure that conflates semantics and pragmatics. Furthermore, Functional Grammar relies on a principle of upward layering (Hannay and Bolkestein 1998b), where structure is generated in a bottom-up fashion: a nuclear semantic unit is taken from the lexicon and is then gradually expanded to include higher layers of semantic, and eventually pragmatic meaning, after which the complex structure is converted to a morphosyntactic string in one go. Due to its ambition to be cognitively adequate (i.e., compatible with theories of processing and production), FDG replaces this bottom-up perspective on structure generation by a top-down principle of downward layering, where more global aspects of the Speaker’s communicative intention are handled prior to lower-level ones. This top-down view also allows for incrementality in the process of structure generation, so that the impact of high-level decisions on surface structure can be implemented directly, and does not have to ‘wait up’ for lower-level decisions to be instantiated.

Other significant changes in FDG with respect to the 1997 version of Functional Grammar are implementations and elaborations of ideas that already were around at the time, but were never ‘codified’. One of these is the adoption of a general template for all layered structure along the lines of Hengeveld (1989); another is a much more detailed account of Dik’s theory of verbal interaction (Dik 1989: 8), the wider cognitive apparatus as a part of which Grammar was eventually supposed to function. A third aspect, finally, concerns the adoption of ideas formulated in García Velasco and Hengeveld (2002) concerning the separation of content nuclei and structural primitives, which has far-reaching implications for the typological adequacy of FDG with respect to its predecessor.

4.1.4 General overview

Figure 4.1 on page 58 gives an overview (with slight modifications) of the model for Functional Discourse Grammar proposed in Hengeveld and Mackenzie (2008: 13), embedded in a global model of extralinguistic components involved in communicative competence. Its component parts, as well as the differences between my adapted

\(^5\)The question whether the changes in FDG with respect to FG warrant a change of name has been the source of some disagreement. For instance Anstey (2004, 2006), while acknowledging the “important discontinuities” between FDG and earlier versions of Functional Grammar, consistently refers to FDG as fourth-generation Functional Grammar (FG\(_4\)).
version of the overview and Hengeveld and Mackenzie’s original version, are discussed in the next two sections: section 4.2 deals with the static components of the model, and discusses the task of the four global components, as well as the internal constitution of the various levels of analysis within Grammar. Section 4.3 discusses the principles that govern dynamic interactions between the various components and subcomponents, and the role of the interfaces.

Figure 4.1 Grammar in a model of verbal interaction
4.2 Static architecture

4.2.1 Components

It has been stated before that Functional Discourse Grammar is a theory of Grammar embedded in a larger cognitive apparatus of components involved in verbal interaction. Whether or not linguistics should concern itself with the study of the extragrammatical components largely depends on one’s understanding of the scope of the linguistic enterprise. Canonical FDG as described in Hengeveld and Mackenzie (2008: 6ff) does not provide detailed accounts of the other components. On the other hand, the authors acknowledge that such work is an important area of future study, clearly stating that the other components may be non-grammatical but are certainly the concern of linguistics. While I subscribe to this view, I also believe that a pattern model like FDG should not be overly ambitious in setting its goals. Extragrammatical components should certainly be described, but from a ‘utilitarian’ perspective: that is, only to the extent that their internal constitution matters to Grammar. The description of the Discourse Bulletin Board given in chapter 3 was written with this view in mind.

The sections below give a very superficial impression of the task of the various extragrammatical components, and the kinds of structures they must be assumed to generate in order for Grammar to do its job. Some aspects of the internal structure of the Contextual Component are discussed in much more detail in chapter 3, because they are crucial to an understanding of the role of information packaging in verbal interaction.

4.2.1.1 Conceptual Component

The Conceptual Component is, according to Hengeveld and Mackenzie (2008: 7), “the driving force behind the Grammatical component”. It is the place where most of the necessary input for Grammar originates in the shape of communicative intentions.

Due to its integrationist view on Grammar, the question how communicative intentions are to be modelled should be of no concern to FDG. With regard to the question what constitutes a communicative intention, some suggestions are found in Harder (2004), who proposes that they consist of a prelinguistic, non-discrete representation of the communicative content to be conveyed, supplemented with specified settings for various relevant interpersonal parameters that affect the conveyance of that content. In Harder’s account, the communicative intention thus is a mixture of Speaker-driven and Addressee-oriented considerations. Hengeveld and Mackenzie (2008: 47) seem to separate both parts, stating that the Conceptual Component “contains the Speaker’s communicative intention and the strategies that he wishes to deploy in order to achieve that intention”. A similar division of labour is proposed in Butler (2008), who argues that the Conceptual Component provides a conceptual and an affective/interactional structure, claiming neurophysiological support for his view. The interplay between Speaker-
driven and Addressee-oriented considerations, as well as their respective loci in the
model and the way in which they affect the structures generated in the Formulator,
will be discussed in more detail in section 4.3.1, where a number of modifications
to Hengeveld and Mackenzie’s approach will be proposed.

4.2.1.2 Contextual Component

Hengeveld and Mackenzie (2008: 9) note that a Speaker’s communicative intention
“does not arise in a vacuum, but in a multifaceted communicative context”. It is the
job of the Contextual Component to make accessible the parts of this communicative
context that are Grammatically relevant, and to record decisions taken at any
stage in the verbal exchange so that they in turn are accessible for the construal
of subsequent utterances. The tasks of the Contextual Component are manifold,
and the theory-laden term ‘contextual’ may be somewhat of a misnomer. Rather,
all input from the Contextual Component is in a sense ‘environmental’. In the
environment in which a language user construes his utterance, at least three separate
issues must be taken into consideration: the interlocutor, the external world and
the linguistic structure generated upstream.

As regards the interlocutor, Speakers rely on models of their Addressees’ presup-
positional and emotional/affective state during formulation, in order to maximize
the impact of their own communicative intention. As we have seen in chapter 3,
these tend to become fairly complex, as Speakers are capable of recursive reasoning
as well as the embedding of ‘third-party knowledge’, yielding models of the kind ‘I
know that he knows that you know that I know ...’. In part, information about
these states derives from earlier encounters with the Addressee, meaning that the
Contextual Component must provide a connection with the Speaker’s long-term
episodic memory. Another part of this information derives from knowledge of
sociolinguistic conventions, meaning that the Contextual Component must have
access to encyclopaedic memory as well.

Second, the physical surroundings of the communicative exchange exert a
profound influence on the structure of the Speaker’s utterances, especially when the
perceptible here-and-now is discussed. This means that the Contextual Component
must somehow be connected to working memory.

Third, the linguistic structure that has been generated earlier in the exchange
is an important determinant of the way a Speaker phrases his communicative
intention. This is not restricted to preceding morphosyntactic structure (co-text);
preceding semantic and pragmatic structure must be available in order to plan
subsequent utterances as well. Discussing written communication, Cornish (2003)
proposes a three-way distinction between text, context and discourse, stating
that “the reader creates discourse on the basis of ... textual cues supplied by the
writer, in terms of a relevant context” (p. 1; see also Cornish (2008)). It is clear

6It is generally accepted that linguistic structure is typically short-lived, and is not
stored as part of episodic memory, which holds merely ‘the gist’ of earlier communicative
exchanges.
that all three are handled by the Contextual Component in Functional Discourse Grammar.

Finally, it should be stressed that the Contextual Component does not just feed Grammar, but is also continually fed by it. It has, one could say, a monitoring function as input from Grammar is continually used to update it. Part of this input is contributed by the Speaker himself, while another part is contributed by the information extracted from incoming utterances.

Like with the Conceptual Component, a full description of the inner workings of the Contextual Component in my opinion is not a central task of FDG. Instead, any model that lends a structure that Grammar can ‘work with’ to the environmental considerations will do. For part of these considerations, such a model has been proposed in chapter 3.

4.2.1.3 I/O Component

Canonical FDG models language from a Speaker perspective. Consequently, Hengeveld and Mackenzie (2008) only consider the interaction between Grammar and speech production, for which they invoke an Output Component that contains an articulator (not shown in Figure 4.1) that generates instructions for the motor systems driving the production of speech. The kind of structures generated by this component are probably best described as low-level sensorimotor schemata (see Drescher 1991: 23ff). To model the Addressee perspective, a parser must be added that converts such input to interpretable strings of grammatical elements.

4.2.1.4 Grammatical component (Grammar)

Grammar, the central component in the model of verbal interaction, consists of four levels of representation at which the various meanings of linguistic structure are modelled, and two Interfaces – the Formulator and the Encoder (the ovals in Figure 4.1) – that connect them. In Hengeveld and Mackenzie (2008), Grammar contains three interfaces, with a fourth – the articulator – located inside the I/O Component. Grammar is organized in a top-down fashion in that the Interfaces generate structure based on the input they receive from higher levels. Structure is generated on the basis of primitives that are drawn from the Lexicon.

So far, FDG has mainly concentrated on providing detailed descriptions of the static output of the Interfaces, while the Interfaces themselves have been treated as black boxes and the dynamic generation of structure therein has remained largely unexplored. To an extent, this tendency relates to the structuralist, pattern orientation of the theory. That is, unlike the structure-generating operations themselves, their outcomes can be studied with relative ease, as they are directly accessible through controlled experiment and distributional analysis. It is inherently difficult, on the other hand, for a functionalist pattern theory to provide a convincing dynamic account of structure generation and still pay heed to the standard of psychological adequacy.
The outcome of the dynamic processes in the various Interfaces is modelled in separate levels of representation, each of which is dedicated to the designation of a particular type of linguistic information: pragmatic, semantic, segmental and suprasegmental. While the levels are not self-contained, they are mutually independent in that their structures need not run parallel, even though they typically do. The non-isomorphism of pragmatic and semantic structure that is inherent in the architecture of FDG constitutes a big step forward in comparison to Functional Grammar, where pragmatics and semantics shared a single level of analysis. The orthogonality of both levels can be fruitfully exploited in the description of information packaging, as will be seen in chapter 5.

One remark on terminology is in order at this point. As can be seen in Figure 4.1, the Formulator and the Encoder both generate two separate kinds of output. The output generated by the Formulator is collectively referred to in this study as functional structure, while the joint output of the Encoder will be referred to as surface structure.

### 4.2.2 Layered structure

Functional Discourse Grammar claims that structure on all four levels of representation in Grammar shares an exhaustive set of abstract combinatorial principles that govern interdependencies between their component elements. This enables the adoption of an abstract template for Level structure, even though the primitives feeding into this template from the Lexicon are different from one Level to the next. The generalized combinatorial principles are also what underlies the system of formal notation that Functional Discourse Grammar uses. The Level-specific implementation is discussed in the next sections; here I will introduce the keys notions on which it is based, as well as the abstract formalism.

Some preliminary observations deserve to be made. Despite being a model with formal aspirations, many of those practicing Functional Discourse Grammar (and before that, Functional Grammar) have an inclination towards a somewhat casual, if not careless handling of its formal aspects. In part, this has to do with the formal notation itself which is daunting to say the least, and therefore very prone to casual usage. Through time, several such simplifications inadvertently assumed ‘official’ status, at the expense of the richer formal notation that they originally stood for. Another reason why Functional Discourse Grammarians do not appear too much concerned with formal notation has to do with the structural-functionalist tradition, in which ‘The Model’ has a much more instrumental status than in other branches of theoretical linguistics, and is regarded as secondary to the data. As a result of both, explicit definitions of theory-internal notions in current FDG are few and far between, as is the justification of their formal implementation. Historically as well, proposals regarding innovations to the formalism have always been put forward in conjunction with a specific linguistic problem in FG, and have scarcely been discussed or surveyed in abstracto.\(^7\) In this light it is unfortunate that the only

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\(^7\)This lack of explicit discussion has led to the tacit ignorance of some formally sound
comprehensive presentation of Functional Discourse Grammar currently available (Hengeveld and Mackenzie's 2008 monograph) pays preciously little attention to the theory's formal apparatus. Discussion of the abstract formalism takes up exactly one page (p. 14), and although some additional comments are occasionally made when its implementation at various Levels is discussed, the formalising orientation of FDG plays a subordinate role in comparison to the other defining characteristics discussed earlier in this chapter.

Given this situation, it is of little use to start with a critical survey of the literature. Instead, in what follows I will attempt to give as precise a characterization of FDG's formal apparatus as possible. All the explicit definitions that are proposed are my own. They do not claim any originality, however: they are merely intended as accurate reflections of how Functional Discourse Grammarians, most prominently Hengeveld and Mackenzie (2008), use the formal notation. It is, if anything, a proposal to codify the status quo and make the formalism explicit enough for rigorous application.

Unlike the linguistic meaning it is used to model, the rules governing the formalism should be as much self-contained as possible since a formal metalanguage need not be sensitive to considerations of psychological or typological adequacy: the leading criteria are economy and elegance. For that reason, the definitions given in the next part are primarily phrased in terms of the combinatorial possibilities and restrictions that hold between the various elements of the formalism. A definition in ontological or functional terms is only resorted to when no sufficient formal properties are available.

4.2.2.1 Symbols in formal notation

The formal notation used in Functional Discourse Grammar is an extension of that used in Functional Grammar, which in turn is based on the traditional notation of first-order predicate logic, a simple linear bracketed structure.

The inventory of notational primitives consists of four 'classes' of elements: units that symbolize the designation of meaning, delimiters that symbolize domain boundaries, relators that symbolize the relationships between Restrictors in a Layer, and a miscellaneous class of elements. Outside the context of representations of concrete linguistic expressions, the FG convention to symbolize units by means of letters from the Greek alphabet is adopted. All elements are printed in regular
typeface. The inventory is exhaustively summarized in Table 4.3.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$</td>
<td>Layer (see fn. 8)</td>
</tr>
<tr>
<td>$h (k)$</td>
<td>Head of a Hierarchical configuration (see fn. 8)</td>
</tr>
<tr>
<td>$\sigma$</td>
<td>Modifier in a Hierarchical configuration</td>
</tr>
<tr>
<td>$\pi$</td>
<td>Operator on a Layer</td>
</tr>
<tr>
<td>$\varphi$</td>
<td>Function assigned to an Argument</td>
</tr>
<tr>
<td>( )</td>
<td>Boundaries of a Hierarchical configuration</td>
</tr>
<tr>
<td>[ ]</td>
<td>Boundaries of an Equipollent configuration</td>
</tr>
<tr>
<td>&lt; &gt;</td>
<td>Boundaries of Selection restrictions</td>
</tr>
<tr>
<td></td>
<td>Definition</td>
</tr>
<tr>
<td>:</td>
<td>Set inclusion ($\in$)</td>
</tr>
<tr>
<td>$\land$</td>
<td>Set intersection ($\cap$)</td>
</tr>
<tr>
<td>♦x</td>
<td>Lexeme (with Part-of-Speech classification)</td>
</tr>
<tr>
<td>$\alpha_n$</td>
<td>Index of a Layer</td>
</tr>
<tr>
<td>—</td>
<td>Omission of complexity</td>
</tr>
</tbody>
</table>

Table 4.3  Elements in FDG formal notation

### 4.2.2.2 Definitions

**Layers.** The central combinatorial unit in Functional Discourse Grammar is the **Layer**, the key property of which is the fact that it serves as a scope domain. Scope domains are thought to be reflected by two classes of morphosyntactic phenomena: as the antecedents of phoric elements and the binding of gaps (henceforth phoric scope), and as the scope of application of modifying elements (henceforth application scope). Illustrations of both are given in (1):

(1) a. An old man came in. **He** sat down at the bar
    b. The victims were an unidentified man and **woman**
    c. **Fortunately** I did not have to wait very long

In (1a), the use of the anaphor *he* in the second clause re-evokes a unit expressed as *an old man* in the first clause: hence, that unit must constitute a Layer. Likewise in (1b), the only possible interpretation of the gap preceding *woman* is proof of the Layer status of a unit expressed as *unidentified*. Finally in (1c), the only units that

Heads in this study.
fortunately and very can be qualifications of are those expressed as I did not have to wait very long and long, respectively.

The relation between phoric scope and Layer status is a two-way implication: all Layers constitute phoric scope domains, and all phoric scope domains reveal the presence of Layers. This is not the case for application scope: while all Layers constitute application scope domains, not all application scope domains have Layer status. A case in point is given in (2):

(2) He drove a fast shiny Lada

The preferred interpretation of an expression like fast shiny Lada could be paraphrased as ‘a shiny Lada that is fast’, rather than ‘a fast Lada that is shiny’. This shows that the unit expressed as shiny Lada constitutes an application scope domain for the unit expressed as fast. However, in the formal notation, this unit is not a Layer.9

Layers are referential, meaning that they can be referred to. The kind of referentiality meant here is not the same as the performance by the Speaker of a Subact of Reference. The latter reflects a choice by the Speaker to use a linguistic element in a particular way, while the former is an inherent property of such elements. Layers are symbolized by a Type variable which has a dual function: to designate general aspects of the Layer’s designation, and to represent the Layer’s entire designation when it is phorically referred to. In order to distinguish between different Layers of the same type, a numerical index is added which can be thought of as a pointer to the location of the Layer’s designation in the stock of linguistic entities.10

Layer. Layers constitute phoric scope domains; they can be phorically referred to. The formal notation for a Layer is $\alpha_n$.

External behaviour. Layers have their name on account of the main way in which they can be combined to form larger units (henceforth configurations): they may be recursively embedded in one another. Such configurations are referred to as hierarchical (cf. Hengeveld and Mackenzie 2008: 14), and can be defined in terms of scope domain implications.

Hierarchical configuration. Multiple layers form a Hierarchical configuration if their scope domains are implicationally related. Externally, Hierarchical configurations constitute Layers. The formal notation for Hierarchical configurations is $(\alpha_n)$.

9In Rijkhoff’s (1990; 2002) alternative formalism, all scope domains are a sufficient condition for Layer status. However, this proposal has not been incorporated in mainstream FDG.

10Hengeveld and Smit (2009); Hengeveld and Mackenzie (2008) distinguish between letter indexes to indicate fully instantiated Layers, and numeric indexes to indicate partially uninstantiated Layers. Since this distinction is only meaningful in the context of a dynamic implementation of FDG, it will be left out of consideration here.
The constituent Layers in a Hierarchical configuration are different in status. A distinction can be made between the head and the modifiers of the configuration.

**Head, Modifier.** In a Hierarchical configuration, the designation of the Head implies the designation of all Modifiers.

The other way in which Layers can be combined is in so-called equipollent configurations. Equipollent configurations are characterized by the fact that they do not constitute a scope domain, unless they are in turn embedded in a Hierarchical configuration.

**Equipollent configuration.** Two or more Layers form an equipollent configuration if no implicational relations hold between their respective scope domains. Externally, Equipollent configurations do not constitute Layers. Their formal notation is \[ \{ \{ \alpha_n \} \} \neq \emptyset \].

A special kind of Equipollent configuration is the predication. A Predication is ‘asymmetric’ in that the constituent Layers do not have equal status. One of them (the predicate) invokes a set, all the members of which are characterized by the property designated by the Predicate. The others (the arguments) identify members belonging to that set. However, the scopes of the Predicate Layer and the Argument Layer(s) are not implicationally related.

Arguments in a predication have a function that qualifies the relation between them and the predicate.\(^{11}\) In many cases, this relation is simply one of application (in which case the function label is \( \emptyset \)), but in others, the relation between the constituent layers in a predication contributes additional meaning to the designation of the Predication. Note that Functions are not assigned by the Predicate, because they come with the Predication Frame (see section 4.3.4). Rather, the Predicate ‘licenses’ Function assignment to the Arguments.

**Predication.** A Predication is an Equipollent configuration consisting of one predicate designating a set and one or more Arguments identifying members of the set. Each Argument has one Function

\(^{11}\)Note again that the characterizations given in this section are configurational: they make no claims about designation, but merely state combinatorial possibilities.

Hengeveld (1992, p.c.) suggests that Functions do not qualify relations between a Predicate and its Argument(s), but rather the respective relations between Arguments. This entails that it is possible to allow function assignment even in the absence of a Predicate. A problematic consequence of this view is that function assignment in monovalent predications should be disallowed, which is not in line with, for instance, case assignment in split-intransitive languages.

Hengeveld (p.c.) points out that the stipulation that Functions occur exclusively in Predications raises questions as to the representation of locative modifiers expressed through case-marking, and other non-Predication constructions in which Functions occur in the traditional FG analyses. It is beyond the scope of this study to address this issue exhaustively; however, several solutions to this problem are conceivable, all of which capitalize on the notion of coercion (Hengeveld and Mackenzie 2008: 229), i.e. a lack of isomorphism between the Representational and Morphosyntactic Levels.
that qualifies its relation to the Predicate. The formal notation for Predications is \( [(\alpha_n) \{ (\alpha_n)_\varphi \}] \), where \( \{ (\alpha_n)_\varphi \} \neq \emptyset \).

Functions are exclusively assigned to arguments in predications, and each argument is assigned one and only one function at a time. The formal behaviour of predications will be discussed in a bit more detail in chapter 5.

**Internal behaviour.** So far, we have discussed how Layers can be combined. Turning now to their internal structure, the question how Layers designate linguistic meaning becomes relevant. They appear to do so in two ways. The first is to invoke a heavily underspecified unit, and define its designation up to a point where it is specific enough to serve its purpose in communication. This definition can be thought of as the allocation of the underspecified unit to a series of sets of features of that unit, which jointly restrict its potential designation.

**Definition.** Definition is the process whereby a Layer is allocated to a (series of) feature sets that restrict its potential designation. The formal notation of Definition is \( \alpha_n \mid \).

Feature sets can be related through intersection or inclusion, illustrated in Figure 4.2. It may be noted that, while the designation that the three sets in the figure contribute to the underspecified unit (the grey dot) is identical in both arrangements, the relationships between the various meaning-contributing sets are different. This leads to different interpretations of their composite meaning; for a fuller discussion, see Dik (1989) and references cited therein.

![Figure 4.2](image-url) Restriction through set intersection and set inclusion

The constructs that designate these sets in the formal representation of FDG are called **restrictors**. It is argued in Smit and van Staden (2007) that Restrictors must have the shape of Predications in order to ensure that Layers have a non-ambiguous designation; I will adopt this claim here.

**Restrictor.** A Restrictor is a Predication that defines the potential designation of a Layer. The relations between Restrictors are formally represented as \( [ ] : [ ] \) for set inclusion and \( [ ] \land [ ] \) for set intersection.
The second way in which the designation of a Layer is instantiated is through the use of operators. Operators are difficult to provide with a formal definition in terms of their combinatorial properties, since in the formal notation they enter into what strongly resembles an Equipollent configuration with the Layer to which they are applied. However, where other Equipollent configurations do not constitute a unified scope domain, the Operator-Layer combination does. Consider the example in (3):

(3) The plumbers fixed my toilet. They were very efficient

Suppose that plurality, expressed as -s in the first clause, is represented by means of an Operator. If the Operator stands in an Equipollent relationship to the Layer expressed as the plumber-, it itself would not be part of that same scope domain. This in turn would mean that the anaphor they cannot pick up the meaning contributed by -s, while it is very clear from the English data that it does: they is taken to refer to ‘the plumbers’ and not just to ‘plumber’. This should make clear that despite their notation, Operators do not engage in Equipollent configurations. In fact, their behaviour is much closer to that of units in a Hierarchical configuration. The only difference between a run-of-the-mill Hierarchical configuration and one in which an Operator figures, is that Operators themselves are not Layers, but this is unproblematic in the light of the definitions given so far.

On the basis of the above, it can be argued that strictly formally speaking, Operators as dedicated elements in the formalism are redundant. The meaning they contribute can equally well be modelled by means of Restrictors, which would rid the formal apparatus of an entire category and thereby significantly improve its elegance. Nevertheless, this proposal will not be implemented in the present study. One reason is that, while Operators and Restrictors are identical in the way they contribute linguistic meaning, the behaviour of the morphosyntactic elements invoked to encode them is different. Meaning modelled by means of Operators is exclusively encoded as closed-class grammatical elements, while meaning modelled by means of Restrictors is exclusively encoded as open-class lexical elements. The question whether this difference is sufficient to warrant the use of dedicated formal means is beyond the scope of this study.\(^{12}\)

**Operator.** An Operator is a Modifier of a Layer. The meaning it contributes is expressed by means of a grammatical strategy. Operators are part of the Hierarchical configuration of which the Layer on which they operate is the Head. Their formal notation is \((\pi \alpha_n)\).

\(^{12}\)In a rigid interpretation of FDG modularity, the distinction between lexical and grammatical means of expression, if relevant at all to Grammar, should not become so prior to the stage of Encoding, meaning that formal distinction between Operators and Restrictors should be abandoned altogether as far as functional structure is concerned. Also, representing both types by means of a single formal category does much to improve diachronic adequacy of the model.
4.2.2.3 Implementation

The definitions discussed so far can be combined to yield two maximally abstract layered structures. The first, used for endocentric layers, is given in Figure 4.3 below.

\[
\left( \pi \alpha_i \mid \kappa \left( \alpha_i \right) _\varphi \right) : \left\{ \left[ \sigma \left( \alpha_i \right) _\varphi \right] : \text{OR} \left( \left[ \sigma \left( \alpha_i \right) _\varphi \right] \land \right) \right\}
\]

**Figure 4.3** Maximally abstract representation for an endocentric Layer

where \( \kappa \) and \( \sigma \) are again instantiated as Layers. Endocentric Layers are characterized by the fact that their potential designation is defined by placement of an underspecified, referential unit \( \alpha_i \) in a set that predicates feature \( \kappa \) of it. Its designation can be further refined by restricting or intersecting the set defined by \( \kappa \) with as many sets \( \sigma \) as necessary, which are always predicated over \( \alpha_i \) to make sure that the Layer under construal remains a member of the designation that is built up. The number of Modifiers is not limited a priori. Furthermore, the designation of \( \alpha_i \) can be modified by application of an operator \( \pi \).

It should be noted that the Relator between the Layer variable \( \alpha_i \) and the Restrictors in 4.3 above is definition (|), and not set inclusion (:). This notation aims to reflect the fact that I regard Layers as finite units, the designation of which is restricted. This is different from their treatment in Hengeveld and Mackenzie (2008), who tacitly follow Dik (1997a: 132ff) and treat Layers as sets which are themselves restricted. The difference between restriction of units versus restriction of their designations is subtle, and relates to the question what Layers in Grammar stand for (see also Keizer 2008). Do they symbolize fully linguistic constructs, or do they symbolize the corresponding extralinguistic information in a more direct fashion? In accordance with its orientation as an integrationist theory, FDG chooses the former. This means that there need be no direct connection between the formal linguistic structure and the structure of the corresponding extralinguistic designation. Thus, while it may well be the case that an Addressee, upon processing a linguistic expression, narrows down a subset of extralinguistic designations up to a point where more than one candidate remains, this need not be reflected by the underlying structure of the Speaker’s utterance. Furthermore, psycholinguistic adequacy arguably is improved by abolishing the notion that, from a Speaker perspective, the units under construal are regarded as sets instead of finite elements. That is, even though an Addressee has to deal with an amount of uncertainty regarding the designations intended by the Speaker, certainly this is not the case for the Speaker himself.

The other maximally abstract Layer is the exocentric layer, illustrated in Figure 4.4, where \( (\alpha_i) \notin \{(\alpha_n)_{\varphi}\}, \{(\alpha_n)_{\varphi}\} \neq \emptyset \), and \( \varphi \) has a unique instantiation for each member of \( \{(\alpha_n)_{\varphi}\} \).

The difference between endocentric and exocentric Layers, the defining property of
which is that the Layer variable does not occur as an argument in the Restrictor, has been around in various incarnations in Functional Grammar. Smit and van Staden (2007: 160) argue that a systematic distinction between the two needs to be made, where exocentric Layers in their approach are employed to handle the insertion of primitives from the Lexicon in the structures that Grammar generates. I will not repeat the entire argument here upon which the proposal is founded; however, an important corollary of the exocentric structures that they propose is that they do not allow for further restriction of the Layer’s potential designation than with a Head consisting of an Equipollent configuration. This configuration can either be a lexically predetermined Predication frame, a lexical primitive or a ‘flat’ series of other Layers.

In the next section, it will be illustrated how these two maximally abstract layered structures are put to work at the four levels of representation in FDG Grammar.

4.2.3 Levels of representation

This section introduces the individual levels of representation. For a fuller overview, see Hengeveld and Mackenzie (2008). Here, the discussion will be restricted to a brief characterization of each Level, and an introduction of those Layers that are relevant to the remainder of this study.

4.2.3.1 Interpersonal level

The Interpersonal level (abbreviated as IL) in the words of Hengeveld and Mackenzie (2008), “deals with all the formal aspects of a linguistic unit that reflect its role in the interaction between the Speaker and the Addressee” (p.46). The central unit at this level is the discourse act (A), defined as “the smallest identifiable unit of communicative behaviour”. (p. 60, following Kroon (1995: 65)). In Hengeveld and Mackenzie (2008), a typical Discourse Act is one that designates a so-called implicit performative speech act. They are assigned the structure given in (4):
where the Head of $A_1$ is formed by a lexically predetermined illocution frame, of which $F_1$ is the Predicate that designates the Illocution. The frame is specified as having three Argument slots: two for the speech act participants, Speaker and Addressee (represented as $P_{1/2}$), and one for a **communicated content** ($C_1$), which “corresponds to the choices the Speaker makes in order to evoke a picture of the external world he wants to talk about” (Hengeveld and Mackenzie 2008: 87).

As the braces indicate, (4) is not well-formed according to the principles proposed in the previous section. The main problem is that the Equipollent configuration used as the Head of $A_1$ (the lexically predetermined Frame for the illocution) is not embedded in a Hierarchical configuration of its own, which creates two complications. First, because the illocution Frame is not a Layer, it does not constitute a scope domain, meaning that unique reference to it would be impossible. Second, the restrictor of $A_1$ is a juxtaposition of an Equipollent configuration (the Frame) and a Hierarchical one (the repeated Layer variable $A_1$), which is not a meaningful combination of elements because it creates interpretive ambiguity. Both problems are resolved in (5), which conforms fully to the principles discussed in the previous sections:

\[
A_i \left( [\left( (S_n \mid [\left( (F_i) \ (P_{1S} \ (P_{1A} \ (C_i)\Phi) \right) \ (A_i)\varnothing \right) \right] \right)
\]

where $S_n$ is an exocentric Layer that represents the retrieval of the lexically predetermined Frame for an implicit performative, which is used to predicate a set of which the Discourse act $A_i$ is a member. Note also that the outermost round brackets have been omitted as well as the outermost Function, since these elements are not relevant when a Layer is analysed in isolation. For subsequent lower Layers, the argument for rewriting them according to the rules and principles of the preceding two sections will not be repeated because it is largely similar. Instead, further Layers will simply be given in their ‘proper’ notation.

The Communicated content is the Layer that contains the interpersonal equivalents for units denoting semantic information at the Representational Level; it could be said its contents reflect the ‘how’ of the message. The Head of $C_i$ is formed by a collection of **Subacts of evocation**, which jointly evoke enough of the denotation of the Speaker’s message for his communicative goal to be achieved. Hengeveld and Mackenzie (2008: 107) emphasize that evocation is to be thought of as “a cooperative action of a Speaker”, and that Subacts of evocation accordingly are to be treated as actional units,\textsuperscript{13} while their denotational instantiation takes place at the Representational Level. Subacts of evocation comprise Subacts of Reference ($R_i$) and Subacts of Ascription ($T_i$). Regarding this distinction, Hengeveld and Mackenzie (2008: 113) state that “whereas Subacts of Ascription involve the

\textsuperscript{13}The notion of having actional units in a pattern model that claims no direct psychological reality in my view is quite problematic. A more reasonable position would be to say that Subacts symbolise, rather than constitute, actions.
evocation of a Property, Speakers perform Subacts of Reference in order to evoke an entity”.

This characterization is unfortunate, because it relies on the representational elements to which the interpersonal actions of Reference and Ascription prototypically correspond, rather than on the interpersonal actions themselves. In doing so, it obviates the key insight that led to the creation of the Interpersonal Level, namely the fact that intensional-representational sense (Fregean \textit{Sinn}) and the extensional-referential purpose for which such senses may be employed in verbal communication (Fregean \textit{Bedeutung}) are relevant to Grammar each in their own right, and independently affect the structure of linguistic expressions. I would therefore propose the following alternative characterizations:

\textbf{Subact of Reference.} Speakers perform a Subact of Reference to evoke a Discourse Referent in Context.

\textbf{Subact of Ascription.} Speakers perform a Subact of Ascription to evoke a Predicate.

A discourse referent is a unit present in what constitutes the Context in Cornish (2003): a multi-level representation of the linguistic material used in the course of verbal communication. Discourse referents typically denote mental extensions as defined in Keizer (2008: 202) – a linguistic representation of an extralinguistic entity – but they need not. A case in point is (6):

(6) A: There’s a urangatang hurdling towards you!
B: That is not how you pronounce it

In (6), B performs two Subacts of Reference, expressed as \textit{that} and \textit{it}. Both evoke a linguistic entity present in the Context: \textit{that} is used to evoke the Layer designating A’s awkward pronunciation \textit{ju’ranataN}, while \textit{it} evokes the proper phonological representation \textit{/s’ranatan/}. Neither evoke the corresponding mental extension \textit{orangutan}, i.e. a representation of the extralinguistic entity hurdling towards B. My adapted definition of the Ascriptive Subact is very similar to that given by Hengeveld and Mackenzie, but captures the configurational status of the corresponding mental extension, rather than its denotation. The advantage of these alternative definitions is not only that we now have a way to describe the use of linguistic units that lack extensional meaning, but also that the tie between Property and Ascription is severed. That is, we can now Ascribe individuals and Refer to properties, something which in the mainstream characterization was not possible.

As a concluding remark on the status of evocational Subacts, it should be noted that Hengeveld and Mackenzie (2008: 111) regard them as layered in a way that is isomorphic to the representational structure they serve to evoke. I find this difficult to reconcile with the nature of Subacts as actional units: even though the execution of actions may overlap in time, that would not be the same as saying they are embedded in one another. Moreover, the phenomena invoked to support Subact layering can equally well be explained by the layered structure of the corresponding
representational structure, which renders such layering redundant. For this reason, I will represent evocational Subacts as though they are not layered, but simply form an unstructured collection of all actions performed by the language user to construe Context. In sum, I will assume the internal constitution of the Communicated Content to be as in (7):

\[(7) \quad C_i \left[ \left( \{S_n \left| \{\{R_i, (T_i)\}\}\right\} \right) (C_i) \phi \right]\]

Where \(\{\{R_i, (T_i)\}\} \neq \emptyset\). The assignment of pragmatic functions, highly relevant to the present investigation, will not be discussed here but in chapter 5.

Moving finally to the internal constitution of evocational Subacts, there is not much left to say. As was pointed out above, I will assume here that Subacts are not internally layered. Furthermore, they do not constitute scope domains: as Hengeveld and Mackenzie (2008: 116) point out, when multiple Subacts of Reference are performed to evoke the same Discourse Referent, these actions are all distinct, indicated by different indices. That is not to say that they do not constitute application scope domains: for instance, (8) illustrates how the act of ascription can be ‘hedged’ in English by the use of sort of, to indicate that the use of EXCITING as a Property predicated of BOOK is not entirely adequate, but provides the best possible fit with the Speaker’s extension:

(8) The book I am reading is sort of exciting

Furthermore, the evocational Subacts host Operators signalling the activation status of Discourse Referents. The most prominent one of these is definiteness, which among other things determines the shape of the article in English.

4.2.3.2 Representational level

While the formal aspects of the linguistic expression that derive from its function in the interaction between interlocutors are analysed at the Interpersonal Level, the Representational Level is concerned with those formal aspects that derive from the representation of extralinguistic ‘reality’ that the Speaker aims to trigger. I will follow the recent proposal by Keizer (2008: 202ff), who argues that the construal of extralinguistic entities is mediated by mental extensions, which are linguistic representations of these extralinguistic entities.

In mainstream FDG, different types of variables are invoked to the extent that the Layers they designate display unique surface structure behaviour. For the Representational Level, however, four types of Layers are considered to be ‘basic’ (Hengeveld and Mackenzie 2008: 131). They are considered to be universally relevant, and can be defined in terms of the ontological dimensions along which the mental extensions they denote can be evaluated. They are summarized in Table 4.4 (see also Lyons 1977: 442ff). It should be noted that f-type Layers are special, 14

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14The need for the exocentric Layer \(S_n\) – designating the insertion of an information packaging frame – will be discussed in more detail in chapter 5.
because their denotata cannot be evaluated on their own, but must be applied to a Layer of another Type.

<table>
<thead>
<tr>
<th>Label</th>
<th>Variable</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property</td>
<td>f</td>
<td>—</td>
</tr>
<tr>
<td>Individual</td>
<td>x</td>
<td>location</td>
</tr>
<tr>
<td>State-of-Affairs</td>
<td>e</td>
<td>time</td>
</tr>
<tr>
<td>Propositional Content</td>
<td>p</td>
<td>truth</td>
</tr>
</tbody>
</table>

Table 4.4 Basic semantic categories in FDG (after Hengeveld and Mackenzie 2008: 131)

In addition to these four types, individual languages’ grammars may warrant a large number of language-specific representational Types. A particularly frequent one is the episode ($ep_n$; see also Hengeveld and Mackenzie 2008: 133ff), which can be characterized ontologically as a thematically coherent sequence of States-of-Affairs. In (9), an illustration is given of a typical representational structure.\footnote{Even a strongly simplified representation as in (9) makes clear that the linear nature of the FDG formalism, notwithstanding the use of shorthand, results in strings that are error-prone both in creation and interpretation. Recent expansion of the minimal structure in (9) with additional intermediate Layers, needed both for reasons of descriptive adequacy (Hengeveld and van Lier 2008) and notational consistency (Smit and van Staden 2007), makes this situation worse.

Even while no concrete proposals will be made in the present dissertation, the (visual) attractiveness of FDG in my opinion would be greatly improved if the linear notation were abandoned in favour of tree structure notation. After all, especially when discussing Levels in isolation, the scope of and interaction between Layers is what it mainly seeks to make explicit, and tree structures are very suitable for just that.}

(9) ‘she kissed him’

\[
\begin{align*}
\text{tensed State-of-Affairs} & \quad \text{transitive predication frame} \\
\text{(9)} & \quad \text{Addressee can evaluate the denotation it encloses in terms of compatibility with his or her own model of the world. The denotation of } p_i \text{ is restricted by predicing a State-of-Affairs (SoA) over it, which is modified by a Past operator that places the denotation of } e_i \text{ in the Past with respect to the moment of speech. The denotation of } e_i \text{ is in turn restricted by predicing an exocentric nuclear predication over it, which is defined by an Equipollent predication frame taken from the lexicon. Such lexically predefined predication frames are specified for their quantitative (number of Argument slots) and qualitative valency (Functions attached to slots).}
\end{align*}
\]
In the case of (9), a typical transitive Frame consisting of slots for a Predicate, an Actor Argument and an Undergoer Argument is selected. These slots are occupied by three further Layers: the Predicate slot is instantiated by a Property, while the Argument slots are both instantiated by Individuals. Note that in the case of (9), the expression of the Individuals by means of masculine and feminine pronouns does not derive from semantic information contributed at RL, but from contextual knowledge that is retrieved at IL. This example is sufficient for now as a basic illustration of the Representational Level: more intricate constructs will be discussed as needed in subsequent chapters.

However, before proceeding we need to shed some light on two important methodological issues. The first concerns the grounds on which non-basic Layers are invoked. That is, the example in (9) is fairly simple. As additional material is added, evidence arises for some of this to be analysed as Modifiers and Operators on the basic Layers already present, while other units may warrant the construal of additional intermediate Layers. For example, Tenny (2000) provides arguments that warrant the invocation of a dedicated Layer for ‘quantified State-of-Affairs’ in English (see also Smit and van Staden 2007: 151). The question is whether a representation of an individual expression whose surface structure does not warrant the invocation of a Layer should nonetheless contain it if distributional analysis can show its relevance for other expressions in the same language. The two possible answers to this question reveal fundamentally different conceptions of the essence of a Layer. The argument that distributional evidence is sufficient to warrant the invocation of a Layer even in expressions where it does not ‘do’ anything is tantamount to saying that Layers denote ontologically relevant units that ipso facto constitute scope domains; whether or not these scope domains are exploited is not important. The argument to avoid the invocation of Layers in expressions where their presence is not warranted by surface structure phenomena treats Layers as purely configurational constructs, invoked by the language user to create scope domains whose denotata may, but need not, have ontological relevance.

While they do not explicitly say so, Hengeveld and Mackenzie (2008) seem to adhere to the former view, and favour language-specific universal underlying structure for all expressions in a language. As will be argued in chapter 5, this view has important consequences for the representation of information packaging at the Interpersonal Level.

The second question concerns the universality of application scope domains. It will be noted that Hengeveld and Mackenzie (2008: 164) propose representing absolute tense Operators such as \( \text{pst} \) on the Episode Layer. Their reason for doing so is that certain languages make a principled distinction between absolute tense (temporal location of (a series of) State(s)-of-Affairs with respect to the moment of speech) and relative tense (temporal location of one SoA with respect to another), and that the morphosyntactic expression of these dimensions reflects different scope domains. English on the other hand is not one of those languages: the question now

\[16\]Hengeveld (p.c.) remarks that FDG describes the grammar of a language, and not the grammar of an utterance.
is whether the fact that absolute tense operates on the Episode in, say, Swahili, is a valid reason for representing it on that Layer in English as well.\textsuperscript{17} This question again goes back to the extent to which a Layer’s ontological and combinatorial characteristics are intertwined, and which of these should be considered ‘primary’ in the process of structure generation.

\section*{4.2.3.3 Morphosyntactic Level}

The two Levels that determine surface structure, the Morphosyntactic and the Phonological Levels, are another major innovation of FDG in comparison to Functional Grammar. While acknowledging the centrality of surface structure, FG limited itself to the study of functional structure and the general question of what principles govern the conversion of functional structure to surface structure (cf. Dik 1997a: 339ff). Surface structure itself remained largely unstudied, save a few very prominent syntactic phenomena such as the relevance of pragmatically determined linear positions and the notion of Subject. But in all these cases, surface structure is portrayed as something instrumental that follows from the semantic and pragmatic structure of the Speaker’s message, and little attention is devoted to matters of formal representation.

Hengeveld and Mackenzie (2008) introduce a fully-fledged formal apparatus for the analysis of morphosyntax, that draws on notational primitives equivalent to those used in functional structure. Hence, the general characterization of these primitives as given in section 4.2.2 above is valid for the Morphosyntactic Level (ML) as well. Unlike functional structure, the linear ordering of which is arbitrary and does not necessarily match the expression, the morphosyntactic representation as generated by the Encoder reflects the linear order of the segmental material in the eventual utterance. Nevertheless, this does not imply that only linear ordering is relevant at ML: from a dynamic perspective, non-linear dependency relations such as agreement arguably are the result of hierarchical layering at ML, even though the static product cannot be described in such terms. The same goes for the actual ‘numeration’ of constituents, which can be the result of absolute sequencing as well as a more complex interplay between absolute and relative clausal positions.

For reasons of methodology discussed in more detail in chapter 6, the language-specific representations found at the Morphosyntactic Level play little role in the present investigation. That is, it is one of the main assumptions of this study that surface structure can be successfully removed from the equation, and in fact should be removed to enable a meaningful cross-linguistic comparison of information packaging. Therefore, no morphosyntactic representations will be used in this study.

\textsuperscript{17}This question becomes even more salient when the \textit{pst} Operator would be the only thing that supports the invocation of Episode. For English, that does not seem to be the case, since there are other phenomena that warrant the use of this Layer.
4.2.3.4 Phonological Level

The Phonological Level (PL) designates mostly suprasegmental information that the I/O Component needs for articulation and parsing, such as prosodic contours. It is also the place in Grammar where morphophonemics and phonotactics have their place. The input to PL is often mediated by ML, but may also originate directly from IL, as arguably is the case for high-level phonological units such as the Utterance and the Intonation Phrase (Hengeveld and Mackenzie 2008: 430ff). Like the Morphosyntactic Level, PL does not play a very prominent role in the present study. The reason for this is practical: notwithstanding the existence of several notational conventions (notably, tōbi. See Silverman et al. 1992), data on suprasegmental encoding – in particular prosody – is not included systematically in the majority of descriptive grammars, or only for a very limited subset of the data they describe.\footnote{This is mostly a problem of data accessibility, rather than data availability. In time it can (and must) be solved by unlocking the wealth of (multimedial) primary data that underlies published descriptive work. The reasons that this is not yet done on a large scale are not linguistic, but are mainly of a financial nature.}

It should be noted that the shortage of data on prosody poses a potential threat to the validity of the findings presented in this dissertation, since it is widely recognized that exactly such information plays a crucial role in identifying a wide range of interpersonal meanings, including information packaging (cf. Pierrehumbert and Hirschberg 1990). Furthermore, important clues as to the global organization of representational structure (cohesion) in longer stretches of monologous discourse are also encoded prosodically.

4.3 Dynamic architecture

In section 4.1.2, Functional Discourse Grammar was introduced as a static model. In this section, some comments will be added regarding its dynamic implementation. In contrast to preceding Functional Grammar, Hengeveld and Mackenzie (2008) expressly present FDG as dynamic (see also Hengeveld 2004), showing for each Level of representation in the Grammar how the static layered output has come about.

4.3.1 Cross-component interaction

In the overall FDG model, two types of interaction need to be distinguished: interaction between Components, and interaction between Levels of representation within Grammar. This section deals with the former type.

Cross-component interaction is not discussed systematically in mainstream FDG. The graphical representation of the overall model as given in Hengeveld and Mackenzie (2008: 13) seems to imply that most of the work is simply done by the Interfaces within Grammar: the Formulator processes those parts of the
Communicative intention that are Grammatically relevant, and converts them into linguistic structure at the various Levels of representation. On the other end, structure at ML and PL feeds into an Articulator (and in the other direction, a Parser) within the I/O Component, where conversion to and from articulatory instructions takes place.

The largest problem resides in the interaction between Grammar and the Contextual Component and, to a lesser extent, the Contextual Component and the Conceptual and I/O Components. That is, since Grammar contains Interfaces to convert extragrammatical information to structures it can process, and the I/O Component contains Interfaces with a similar task, it would make sense to assume a similar Interface in the Contextual Component that converts what I called ‘environmental considerations’ in section 4.2.1.2 to structure that can be handled in Grammar. On the other hand, it may be a good choice to postulate that all contents of the Contextual Component are linguistic in nature, as seems to be the underlying assumption in Keizer (2008) and Cornish (2008). If so, no conversion is necessary, and Context may simply be used as a ‘storage room’ for Grammar to use.

Another issue concerns the interaction between the Conceptual Component and Grammar, which in mainstream FDG are kept strictly separate. Various authors have argued that FDG should be more inclusive in this regard and, consequently, less ambitious in its attempt to formalize underlying structure. A detailed proposal along these lines is made in Anstey (2004), who advocates the replacement of FDG’s grammatically relevant semantics with what he calls conceptually relevant semantics. The incorporation of conceptually-relevant semantics into Grammar is problematic however, because the resulting multiformity in the input cannot easily be reconciled with the ambition of FDG to go beyond mere description and provide insight into the generation of linguistic structure on the basis of a limited set of principles. That said, there are phenomena (for instance, creative language use, metaphoricity and more in general processes in which lexical elements are used ‘inappropriately’ to give rise to new meaning) which necessitate more direct links between the Lexicon and the Components surrounding Grammar.

The interaction between components can be exploited to account for the interaction between Speaker-driven and Addressee-oriented considerations discussed in section 4.2.1.1 that lead up to the formulation of structure at the Interpersonal Level. That is, the choice for a particular illocutionary frame, triggered by the Speaker-driven communicative intention, could be understood to constrain which and how many of the cooperative considerations from the Contextual component are heeded. A clear example would be the difference between DECLarative and INTERrogative illocutions, which make reference to different subsets of contextual information. On a side note, this way of viewing the construal of the illocution allows for a three-way division of communicative competence (see Figure 4.5). The NLU may be unable to select a frame appropriate for his own communicative intention (communicative incapacitation); he may be unable to heed the Addressee-oriented Gricean maxims (communicative incompetence); or he may deliberately decide to flout these maxims (communicative uncooperativeness). This is a good
example of how the interaction of Components in the overall model can help us to shed new light on (and eventually overcome) the basic assumption of happy discourse that underlies most descriptive work in linguistics.

![Figure 4.5](image)

**Figure 4.5** Levels of communicative proficiency

### 4.3.2 Interfaces within Grammar

Functional Discourse Grammar distinguishes three interfaces that link the various Levels of representation within Grammar. The Formulator takes care of all conversion of extragrammatical information to functional structure at the Interpersonal and Representational levels, while two Encoders convert functional structure to morphosyntactic structure and phonological structure.

The two Encoders have been collapsed in Figure 4.1. Hengeveld and Mackenzie (2008) do not give arguments why the conversion from functional structure to surface structure should be handled by two dedicated Interfaces. Furthermore, in terms of the model’s architecture, it should be noted that the process of encoding is no more complex than the process of formulation: both take input from a variety of sources, and both generate output on two dedicated Levels of representation. Finally, an important reason to treat Interpersonal and Representational Levels as distinct outputs of a single Interface is that fact that a dynamic account of structure generation at either Level must have access to information present at the other one: much the same can be said for the interaction between phonological and morphosyntactic encoding – for instance in the domain of morphophonemics – which would then also require that both types of structures are generated by a single Interface so that a kind of feedback or cyclical encoding is made possible.\(^{19}\)

\(^{19}\)With regard to terminology, it should be noted that FDG uses the same labels as Levelt (1989) in his *blueprint of the Speaker*, but in a slightly different way. That is, Hengeveld and Mackenzie (2008)’s model of verbal interaction contains two types of ‘preverbal’ structure (the communicative intention in the Conceptual Component,
4.3.3 Dynamic formulation

Dynamization of the FDG model is a recent innovation. The main precursor of the present proposals in this direction is work by Bakker and Siewierska (2004), who – already in the developmental stages of FDG – present a detailed proposal of dynamic surface structure generation on the basis of multi-level input. Their contribution unfortunately gained very little support in mainstream FDG, on account of the accompanying claim that FDG was to be regarded as a process model of the NLU, rather than a pattern model of Language.

Their idea is built around the notion of a tree, construed by a processor in a top-down, depth-first, start-to-finish fashion. These principles reflect the top-down architecture of FDG and the incrementality of natural language processing (see Levelt 1989: 23ff), whereby higher-order structure is processed by lower-order interfaces as soon as it becomes available to them, and does not await full saturation at higher levels. Whenever the processor hits a node in the tree that is fully saturated, or one it cannot instantiate further with the information available at that point, an auxiliary backtrack principle is invoked that allows the processor to go back up the tree to a point where downward instantiation can recommence. Together with the information from functional structure that is invoked at each node, these three principles provide an elegant account of surface structure generation. Dynamic encoding is schematically represented in Figure 4.6.

Mainstream FDG, while rejecting the idea of Grammar as a model of the NLU, adopts the principles provided in Bakker and Siewierska (2004) and extends them to the construal of functional structure. Hengeveld and Smit (2009) provide a sketch of structure generation at IL and RL as it takes place in the Formulator, arguing that similar principles are needed: a top-down principle states that the scope relations that obtain between Layers on a single Level reflect the order in which they have been construed (for example, the generation of a layer for Communicated Content must have taken place after construal of the Discourse Act in which it is embedded), while a depth-first principle states that every decision at a higher Level is passed straight on to lower Levels so that structure generation can commence there as well. Bakker and Siewierska’s left-to-right principle does not apply to the construal of functional structure, because linearity is mostly irrelevant at IL and RL.²⁰

and functional structure in Grammar), while Levelt collapses these in a single preverbal message, generated by a Conceptualiser. Levelt then adopts formulation as a cover term for morphosyntactic and phonological encoding. Note also, that the interaction between the two levels of encoding is implemented in Levelt’s model in a systematic fashion (Levelt 1989: 9, 300ff).

²⁰I came to realize that the account in Hengeveld and Smit (2009) is incomplete. The top-down notion used there collapses the order of construal of hierarchically related Layers with the order of construal of Restrictors, between which no scope relations apply: for instance, while \( f_i \) is in the scope of \( x_i \), \( f_j \) is not in the scope of \( f_i \) in \( x_i [[f_i] (x_i f)] : [[f_j] (x_i f)] \). Still, we would like a dynamic account of formulation in which \( f_i \) is construed prior to \( f_j \). If the claim were abandoned that linear order at RL is merely a convention with no psycholinguistic relevance, the left-to-right principle could be used to capture this distinction.
Notes. The figure presents an outline of the dynamic encoding model. The numbers reflect the order of (partial) construal of nodes; round nodes are intermediate, square nodes are terminal. Solid lines represent top-down, begin-to-end construal; dotted arrows represent ‘backtracking’ to the closest point where downward construal can recommence.

Figure 4.6 The dynamic encoding model (Bakker and Siewierska 2004)

As an illustration of how this could work, consider the first stages of the construal of a Discourse Act. To construe his Act, the Speaker starts by invoking a Layer $A_i$ at IL. As the next step, he selects an illocutionary frame and then an emphatic Modifier, in accordance with his communicative intention. The illocutionary frame provides a number of slots to be instantiated, one of which typically is that of the Communicated Content. At this point, the Representational Level becomes relevant as well, because the invocation of a $C_i$ presumes the presence of semantic meaning. According to the depth-first principle, a $p_i$-Layer is construed at RL. From this point onwards, representational structure and interpersonal structure must be formulated in tandem, as Hengeveld and Smit (2009) point out. That is, it is little use for a language user to decide on Subacts of Ascription and Reference without knowing which entities are to be ascribed and referred to.

So far, dynamization has only been discussed in terms of hierarchical configurations. The question arises whether equipollent configurations can be explained by using the same principles: that is, if there are no scope relationships between Layers in an equipollent relation, can top-down or depth-first be used to explain the order in which they are construed? Hengeveld and Smit (2009) propose that the order of construal of Layers in equipollent configurations is co-determined by information that percolates up from lower Levels in the Grammar. For instance, the insertion of a transitive predication frame at RL in conjunction with certain settings at IL may trigger a morphosyntactic template with slots for V, A and U in those
order. Since there is no hierarchical configuration at RL that determines which of these should be instantiated first, the information that the V-slot comes first in expression is thought to percolate back up to the Formulator, which continues formulation on the basis of that information. In a similar fashion, certain choices at the Representational Level may constrain corresponding possibilities at IL.

4.3.4 Lexicon

Throughout the process of structure construal, input from the Lexicon plays a crucial role. In mainstream FDG, the Lexicon is currently divided in three parts which correspond to the Interfaces to which they provide input. Across these parts, a two-way distinction can be made between two types of elements in the Lexicon: Lexemes and Frames. Frames are ‘prefab’ pieces of layered structure. They are configurational primitives, meaning that Grammar cannot generate them. A Frame can be thought of as a series of slots in which further units can be inserted, and (if the Frame designates a Predication) a number of Functions that specify the way in which the interaction between the fillers of those slots contributes to the designation of the whole. Lexemes are elements that can fill slots in layered structure. They are primitives designating nuclear meaning for which the language at hand provides no further decomposition.

Smit and van Staden (2007) argue that the common denominator of lexical elements is that they cause exocentric Layers: their role in designation is not to locate a unit under construal in one or more extension sets, but to insert the features that define extension sets. They propose using the special variable $ for all insertions of material from the Lexicon; I will do the same here.

Given that FDG is a strongly lexicalist theory of language (see section 4.1.2) with a constructionist, rather than a nativist inclination (Butler 2003: 39), a considerable part of the explanatory burden rests on the Lexicon. Yet, current FDG provides no detailed account of this component, nor of its interaction with Grammar and extragrammatical knowledge. This leaves a large number of questions unanswered, in particular the thorny issue of selection restrictions and semantic decomposition (how and where does FDG account for the fact that not all Lexemes may occur in all Frames; how do we explain the boundaries to and partial predictability of creative language use) and the role of the Lexicon in language change (attrition;

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21 The dynamic account of formulation given in Hengeveld and Smit (2009) has far-reaching consequences for the architecture of the FDG model. In particular, the strict modularity that is presently advocated in Hengeveld and Mackenzie (2008), in which no information can feed back into the Formulator from below (save through the Contextual component) has to be abandoned. The possible consequences of this change are beyond the scope of the present dissertation.

22 Note again that the term ‘configuration(al)’ is used in this dissertation to refer to the combinatorial behaviour of units within Grammar. This is different from its usage in Hengeveld and Mackenzie (2008); Hengeveld and van Lier (2008), who use the phrase ‘configurational property’ to refer to a specific representational Layer. Hengeveld (p.c.) remarks that ‘situational concept’ would be a more appropriate name for that Layer.
acquisition; contact; diachronic development). A different question regards the association of functional meaning, segmental form and combinatorial potential of linguistic elements, which in the current architecture are spread across separate Lexicons which are not mutually accessible but through Grammar. As a possible solution to this issue, Anstey (2004) proposes a constructional approach to the Lexicon, in which the information needed at various Levels of representation is stored as a single lemma. In anticipation of such adaptations, which I consider to be inescapable, the three-way division of the Lexicon has been abandoned in my own graphical representation of the model given as Figure 4.1.

4.4 Conclusion

This chapter provided an introduction to the framework used in the research that this dissertation reports on. The global position of Functional Discourse Grammar as a structural-functional theory of language was discussed in section 4.1.1. Section 4.2 and 4.3 present static and dynamic aspects of the model’s architecture, respectively. The approach chosen in those sections is a simultaneous presentation of the status quo in mainstream FDG as laid out in the literature, and a critical reappraisal that gives rise to various adaptations thereof. Nevertheless, it has not been the intention of this chapter entirely to reshape Functional Discourse Grammar; it merely approaches it from a perspective of formal and notional consistency, rather than descriptive and psychological adequacy. This necessitates a number of changes in how things are done, but not how they are thought about. The result is a model that is more robust in its operation, while still conforming to the functional-structural principles on which it is founded.

Many aspects of FDG, especially its treatment of specific linguistic phenomena and the behaviour of specific units in the model, remained unaddressed. To the extent that those are relevant to the research, they will be dealt with as they come along, with reference being made to the general principles reviewed in this chapter.

The black box problem. In the light of the comment above about strengthening the formal consistency of FDG, there is one remaining issue that needs to be discussed in this chapter: the ‘reality’ of linguistic modelling. More specifically, what are the ramifications of using a model of language that invokes several levels of underlying structure?

It may be noted that in Functional Discourse Grammar, a linguistic expression as perceived by the Addressee is the result of, subsequently, formulation, encoding and articulation. Although distributional analyses and experimental techniques can lead to certain assumptions about structure at the intermediate levels of representation, it must be stressed that these are not directly accessible. What results is a process in which ‘hard facts’ (acoustic strings) are generated as the output of an unknown set of processes in the Articulator, the input to which is an assumed morphosyntactic structure. This morphosyntactic structure is generated as the output of an unknown set of processes in the Encoder, the input to which
are assumed semantic and pragmatic structures. The semantic and pragmatic structures, finally, are generated by an unknown set of processes in the Formulator, on the basis of assumed communicative intentions and contextual considerations, neither of which are considered the job of linguistics to describe.

What makes matters worse is that the relations between structures at the various levels of representation must be assumed to be many-to-many (see Butler 2003: 10), and are most likely amenable to complex local conditioning, in that the consequence of any higher-order decision at a lower level may vary both according to the surrounding decisions and the surrounding circumstances. The resulting picture is so incredibly complex that it will be clear that those involved in theoretical modelling should be very modest about their goals, especially when their models are based on limited amounts of non-contextualized linguistic expressions, uttered by a limited number of participants in a limited number of situations.

Therefore, modelling is not to be regarded as an ultimate purpose, but rather an instrument to help structure the confusing enterprise that is linguistics, by enabling the formulation of new hypotheses and providing a notational-descriptive framework for testing them. Put differently, models of Grammar are no machine blueprints: one could be implemented, but there would still be no telling what it produced if the NLU put it in motion. Linguistics – due to the richness of language users’ communicative intentions and the uncontrollability of contextual variables – can at best provide explanations a posteriori. This in my view entails that process-oriented models of entire grammars, however much we need them eventually to understand the relation between language and language user, are still well beyond our grasp.

The above argument supports the suggestion in Hengeveld and Mackenzie (2008) that the architecture of Grammar must observe psycholinguistic explanations, without reflecting the psycholinguistic processes themselves. This ties in neatly with a common objection in FDG circles against the expanding number of Layers at IL and RL, which many of the theory’s supporters think adversely affect the model’s psychological adequacy. This is simply not true; more precisely, the improvement in descriptive adequacy that such Layers cause prevails over the – fictional – decline of psychological adequacy. The fact that the resulting structure ‘looks more difficult’ merely reflects the richness of underlying structure, while it has no bearing at all on the ease with which the corresponding expression is generated by the NLU. On the contrary, the cognitive counterpart of a typographically ‘heavy’ representation may in fact be simpler to generate if fewer principles are needed.