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Functional Procedural Grammar: an overview

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FUNCTIONAL PROCEDURAL GRAMMAR

an overview

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0. INTRODUCTION

In this paper I will sketch a general overview of 'functional procedural grammar' (FPG).[1] Ultimately, FPG is intended to be a full-fledged formalized model of the cognitive systems responsible for language (discourse) production. This goal is still far removed, however, and this paper is only a tentative attempt to inventory and mutually relate various systems of procedures that must be involved in speaking, and therefore have to get an appropriate place in a processing model. No large-scale proposals for formalizing FPG are available so far.

FPG takes functional grammar (FG) as a starting point, taking for granted the cognitive plausibility of some of the main principles on which this model is based. But it goes beyond FG in that it integrates (a modified version of) FG into a wider framework covering (what is believed to be) a more complete set of processes involved in transforming some conceptual knowledge representation into a natural language discourse. As will be shown below, so far the main modification of FG concerns the position of the pragmatic functions in the model. As to the wider cognitive framework, FPG takes a point of view markedly different from the one defended by Dik (1987, among others), in that it starts from the supposition that knowledge representation is non-linguistic. I will not repeat the argumentation for these differences with FG here; on the former see Nuyts (1987), (1988), (1989b) on the latter see Nuyts (1988), (1989a), (i.p.). A general motivation and situation of various aspects of FPG, such as the basic choice of a functionalist orientation, the relationship between language production and understanding, the motivation of the different options in the grammar presented below, etc., is to be found in Nuyts (1988: ch.4).

The following exposition mainly intends to show the direction in which the process model might be developed, to show points of contact with research reported on in the literature, and to indicate crucial questions for future research. I will concentrate on those dimensions of FPG in which it differs from, or elaborates on FG. I claim no exhaustiveness for the inventory, though I have attempted to integrate as many phenomena as possible. From section

2. onwards, the order of presentation is meant as a tentative suggestion concerning possible groupings of and successive relations between sets of procedures.[2]

1. GENERAL PRINCIPLES OF THE GRAMMAR AND THE LEXICON

Language production is the process in which some conceptual knowledge representation is systematically transformed (encoded[3]) into a series of commands for the articulatory organs producing the acoustic pattern which constitutes the linguistic utterance. The 'basic material' - i.e. the information serving as the direct input to the process - is some state of affairs which is relevant in the actual communicative situation and which the speaker wants to communicate to the hearer (cf. 2.). Yet, the process is conditioned not only by the properties of the conceptualization of the state of affairs itself, but also by a number of other cognitive factors, at least including (i) the speaker's perception of the properties of the specific environment (linguistic and otherwise) in which the verbalization is taking place, (ii) the speaker's intentions, plans and goals, (iii) the social and interpersonal conventions which in the speaker's perception apply to the setting and to the specific relationship between him and the hearer, and last but not least (iv) the speaker's beliefs about the hearer's knowledge of these factors (the 'partner-model' - PM).[4] These other factors 'graft' themselves upon the structure being processed by influencing the decisions taken within the system while it is transforming and encoding the input conceptualization into a verbal pattern.

This means that language production (like language understanding) has to be seen as a strongly interactive process, in which different types of information are freely accessible, and which is guided by a rather active control system allowing considerable flexibility in processing (probably something like a 'blackboard control' system - cf. e.g. Hayes-Roth 1985). The production system itself can be regarded as a large set of options and procedures developing them, connected in parallel and/or in series. The control system has to choose between procedures on the basis of a sometimes rather complex decision procedure taking into

account all relevant sources of information.

The potential influence of sources of information other than the input structure will probably diminish the more the process approaches the surface structure, which means that active control can gradually be replaced by automatic processing (by means of what is sometimes called 'demons' - e.g. Kempen 1977). Pre-lexical procedures, which have a major impact on what is going to be said (e.g. determining the tense of the predicate), must be strongly sensitive to a variety of factors alongside the input-structure (i.e. they must be under active control). But many purely syntactic processes, and morphological and phonological processes even more so, can be purely input-oriented (i.e. they can work automatically) since they only have to develop the implications of decisions taken earlier on in the process (e.g. transposing the tense of the predicate into a morphological marker expressing it). This corresponds to the different effects that errors in the choice or performance of procedures on the different levels can have. Errors at 'deep' levels do not directly lead to formal mistakes, but rather to functionally maladapted utterances which have the potential of causing communicative misunderstandings. Errors at superficial levels, on the other hand, rather lead to formal mistakes, and are as such much more easily recognized by the communication partners. Still, even at rather superficial levels it may sometimes be necessary to access external information: some phonological and even phonetic choices (e.g. the exact pronunciation of a word or a sound) can be sensitive to socio-cultural conventions.

Below I will not be concerned with the control system, but only with the sets of procedures that could be involved in the production of utterances. However, it is important to bear in mind that flexibility in processing implies that there is not just one single way to run through these processes. Of course, the control system has to respect dependency relations between procedures (it is impossible to assign a grammatical subject marking to a term as long as it has not been assigned the syntactic function of subject). But apart from this, it can run through the system of procedures in various ways (cf. Nuyts 1988: 605ff). The (tentative) ordering of procedures below only intends to reflect dependency relations between procedures.

If speaking is a matter of transposing a conceptual representation into a linguistic pattern, it can be assumed that the language production systems (henceforth 'grammar' - this term is used here in a very wide sense) can be roughly subdivided in two parts, viz. the pre-lexical or pre-verbal procedures resulting in the choice of lexical patterns (predications in FG-terms), and the post-lexical or verbal procedures shaping these lexical patterns into surface structures in the format of temporally ordered commands for the articulatory organs (the proposals in FG mainly concern this part). Yet, this distinction should not be taken too strictly. In any case, it is questionable whether the lexicon (i.e. the stock of verbal means available in some language) can be situated at one particular place in the grammar.

As will appear below, the grammar should be able to get access to function words and morphemes at different levels: even before the predication is constituted (e.g. for certain sentence connectors), but also at very superficial levels (e.g. for flexion morphemes or prepositions). And it is likely that the stock of content lexical items has to be accessible from very early in the grammar onward. For, even with respect to processes which in themselves should be characterized as pre-verbal, it might be useful for the speaker to be able to take into account the lexical means at his disposal. Finally, language psychologists have found that the phonological patterns of lexical items become available only very late in the production process (cf. Garrett 1980, Kempen and Huijbers 1983, Harley 1984). This might require access to the lexicon once again in a late stage of the production process (but see Levelt and Schriefers 1987). In summary, the process of verbalization appears to be continuous. There must be a certain point in the grammar at which the speaker must finally decide on the verbal pattern he is going to use. But the lexicon has to be accessible at different places in the grammar, and thus must be regarded as a component running parallel to the grammar.

As far as the internal organization of the lexicon is concerned, FPG largely subscribes to the FG view on the structure of individual entries (the predicate frames), as well as on the systems for predicate and term formation. But it holds a different view in some respects, and some additional remarks are due as

well.

(i) There is no clear reason for having selection restrictions in the lexicon. The notion of semantic selection restrictions has been heavily criticized, mainly by language psychologists, on the basis of the consideration that the problems for which it is invoked are of a conceptual, and not of a linguistic nature. Hence, they should be dealt with at the level of the general conceptual (world-) knowledge, not in the grammar. Dik (1978: 45) does not subscribe to this view, although without explicit motivation (Dik i.p. does mention some arguments). Arguments in support of the alternative can be found, e.g., in Levelt (1973), Miller and Johnson-Laird (1976), Johnson-Laird (1977), (1983), Schlesinger (1977), Miller (1978). And Steen (1985) argues convincingly for the claim that selection restrictions are not well suited to accounting for metaphor in language[5] (see also Lakoff and Johnson 1980, who treat metaphors as conceptual phenomena). Selection restrictions seem to be a typical example of principles which have been introduced in linguistic grammars due to a limitation of attention to syntax. Such a limitation unavoidably leads to 'imperialism', in the sense that attempts will be made to handle phenomena in the grammar which really do not belong in its realm (cf. Nuyts 1988: 78). In any case, as long as there are no good arguments to show that speakers' general knowledge of the world is not sufficient to account for the occurrence of semantic restrictions on the insertion of terms into predicate frames, preference should be given to the claim that no selection restrictions are required in the linguistic lexicon. Specifying them in the lexicon would be redundant, since the matter has to be handled at the conceptual level anyway. (Cf. also Comrie 1980 and Dik 1980b.)

(ii) Lexical definitions appear to be superfluous in the lexicon as well. It is more appropriate to account for the definition (the meaning) of a lexical item in terms of the characterization in the speaker's knowledge of the world of the concept or conceptual cluster to which the lexical item is linked. One observation in favor of this view is the fact that people are able to provide different definitions of one lexical item depending on the context and requirements. E.g., one individual can, depending on the circumstances, provide quite different definitions of 'a government',

starting from something like 'a board of experts, ministers, who rule a state' to something like 'a bunch of political friends earning a lot of money'. Definition is no doubt extremely flexible, both in the quantity and quality (content) of the information provided. It would not only be hard to account for this in the lexicon, but would also be highly redundant because all this information has to be present in the speaker's knowledge of the world (his 'encyclopedia') anyway. Therefore, it seems better to handle the determination of the meaning of an item in the lexicon in terms of a reference (a 'pointer', as it is called in artificial intelligence - cf. e.g. Schank et al. 1975, Kempen 1978) to the concept or conceptual domain in the encyclopedia of which it is the label. Definition is then a matter of describing the situation of this concept or conceptual domain in a wider network, in terms of the aspects relevant to the communicative situation.

(iii) The lexicon also has to contain proverbs and other formulaic expressions, idioms, etc., which most probably are stored as fully specified predications.

(iv) The distinction between a lexical item as a structural phenomenon and its phonological realization (or realizations, in the case of morphologically irregular variants) must have some manifestation in the lexicon, in view of the observation cited above that the latter becomes available only late in the process of language production. How this should be realized in terms of the organization of the lexicon is an open matter (cf. Harley 1984 for a discussion).

(v) Another matter of organization is the relationship between the stock of function morphemes and the stock of content morphemes in a language. Observations in theoretical linguistics about the typical characteristics of each of these categories suggest a clear differentiation between them. The observation that the function words, e.g. in agrammatism in Broca aphasia, appear to be a differentially disturbed category (cf. e.g. Saffran et al. 1980) points in the same direction, similarly with the observation that function words appear to behave differently from content words in non-pathological speech errors (e.g. Garrett 1980). Maybe these are arguments for postulating a separate lexicon for the function

words, but how to realize this is an open question.

(vi) Another open question is how the content morphemes should be organized in their lexicon. Some speech errors (word substitutions holding a clear phonological relationship to the target word) suggest a phonological ordering principle, others suggest a semantic ordering principle (cf. Garrett 1980). Of course, this reminds one of the observation in (iv) above that the lexical items and their phonological shapes become available at different places in the grammar. Does this mean that these data are stored in different places or in different ways? Or should these speech errors be explained in terms different from the organization of the lexicon (e.g. in terms of processes in the grammar)? These are matters for future research (cf. e.g. Harley 1984).

Let's try then to provide a global picture of the various elements that will have to be involved in the grammar.

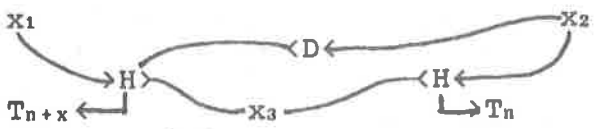
2. THE 'SITUATIONAL NETWORK' AS CONCEPTUAL BASIS FOR A DISCOURSE

In the default case, speaking starts with determining which information (the relevant state of affairs mentioned in 1.) is going to be expressed[6]. Let's call the conceptual structure containing this information the 'situational network' (SN). We consider the SN a representation of variable size, but one which can certainly be larger than what is normally expressed in one single linguistic utterance. In fact, an integrated system of language production must be able to handle the level of the composition and organization of the discourse (text or conversation), alongside the level of the constitution of the utterance. While in the organization of an utterance the verbal means of a language have a crucial role to play, this is much less the case for the construction of a discourse. This suggests that discourse organization will mainly have to be handled at a pre-verbal level in the grammar. Thus, the processes leading to the composition of the predication not only have to take care of the transformation of a conceptualization into a verbal pattern; they are also responsible for the textual cohesion of a series of related utterances, and for the adaptedness of such a textual complex in the wider context of the running discourse.

Therefore, we assume that the SN covers an integrated representation of the information which the speaker would like to express during one 'turn' in the discourse. It is also the structure the speaker will constantly be drawing upon while producing individual utterances as parts of the turn. By 'turn' we mean one period in a discourse during which the speaker has the floor without being interrupted by the hearer (probably except for back channel cues) and without changing the theme. This can be considered the basic unit at the discourse level (Franck 1980).

The SN is derived from or based upon the 'universe of interpretation' (UI) of the speaker, i.e. that part of the entire stock of world knowledge in the speaker's encyclopedia which is activated in the actual communicative situation (cf. Nuyts 1988: 558ff). Presumably, the information stored in the encyclopedia (and thus present in the UI) is 'situation-independent', i.e. it is represented in a format independent from conditions specific to situations (cf. Nuyts 1989a, i.p.). A suggestion for a representational format is made in Nuyts (1988: 593ff), (1989a). I will not repeat the details and the motivation here. It suffices to know that it consists of a conceptual network, in which nodes represent concepts and lines relationships between them. While there is no a priori restriction on the number and types of concepts, we start out from a limited and purportedly universally valid set of relators, viz. 'have' (H), 'be' (B), and 'do' (D). Thus, to give one example, take the transfer of an object from one person to another, e.g. John handing over a book to Mary. The basic conceptual representation of this action in the UI and SN could be like (1).

(1)



(x_1 = 'Mary', x_2 = 'John', x_3 = 'book'.)

Once the information from the UI has been introduced into the SN it will gradually have to be adapted to the characteristics of the specific situation. At the level of the SN itself, we can assume a first series of adaptation operations concerning the information in the SN as a whole. We assume that these (and later) procedures are valid for discourse in general, i.e. both conversation and monologue/text. No doubt there will be differences in the

actual ways these procedures are applied in both discourse types, due to the typical characteristics of each. Yet, the principles of the system, the basic procedures, can be taken to be identical (i.e. both types are handled in terms of one and the same cognitive system). At least the following sets of procedures can be distinguished.

(i) Composing and monitoring the SN

The speaker has to decide which information he is going to include in the turn he is about to produce. The notion of turn is not easy to pin down, however, and correspondingly, the exact range of procedures involved here is not a priori evident.

A first matter is the potential size of a turn (and thus of the SN). In normal conversation turns tend to be relatively short (sometimes they involve only one utterance). But in principle a full-fledged monologue (a 'text') can be considered a turn as well: during a one-hour speech one speaker has the floor without interruption and without changing the central theme. Yet, it seems unlikely that all information transmitted during this speech will be present in the SN at once. Most probably there has to be an upper boundary to the size of the SN (though it is not a priori clear where - probably research on types of memories and their capacities might help here).

This would imply that there can be a lively interaction between SN and UI. In case of long monologues, some core conceptualization of the central theme might remain within the SN, as a reference point for different more limited conceptualizations of sub-themes. Such sub-conceptualizations might be introduced into the SN one at a time, each one remaining there until it has been formulated and can be returned to the UI and replaced by another sub-conceptualization from the UI (certainly, this can be a gradual and continuous process). In formulating the processes involved here, one could learn from the principles proposed by Van Dijk and Kintsch concerning the structuring and treatment of information in discourse understanding (cf. e.g. Van Dijk 1978, 1981, Kintsch and Van Dijk 1978, Van Dijk and Kintsch 1983). Of course, there has to be some 'bookkeeping' of what has already been communicated and (probably also) how it has been communicated, and what is still to

come.

In case of a normal conversation on one central theme, the situation might be comparable. Here again, some core conceptualization concerning the theme of the conversation can be assumed to remain in the SN, while for each turn new sub-conceptualizations are introduced from the UI. There is a wealth of literature, from conversational and discourse analysis, but also from psychological and artificial intelligence research into dialogue models, which can be brought to bear on a detailed development of these aspects with respect to conversation (procedures of turn-taking, the relations between successive turns in terms of content and structure, and also the way turns are organized internally (see below)), including Sacks et al. 1974, Weiner and Goodenough 1977, Power 1979, Hobbs and Evans 1980, Fortescue 1980, Franck 1980, Weijdema et al. 1982, Levinson 1983, Lehnert 1984.

Another problem in determining a turn is its internal continuity. Within one set of utterances concerning a specific theme a speaker can make sideways which are only indirectly related to the main theme. However, this does not have to involve a new turn. The information for this sideway can certainly be present in the SN together with the information more closely related to the theme, without there having to be an exchange with the UI. Of course, if the speaker at a certain moment concludes a theme and switches to a completely new one, there will be a switch in turns, even if he is not interrupted by the hearer in the mean time. Cognitively, one can imagine this to be a procedure in which the speaker clears his SN (nearly) completely and reinstalls it for the theme of the new turn. Another situation occurs if an interaction partner interrupts the speaker, e.g. because he did not understand a specific word. Again it is doubtful whether this involves a change in turns. In any case, there will not be much of a change in the speaker's SN, though there do have to be procedures monitoring such 'side-sequences'.

Anyway, it can be assumed that the contents of the SN are constantly changing, even in the middle of the process of verbalizing what basically constitutes one turn (this changeableness and flexibility of the SN might help to explain the fact that in real discourse it is often very hard to clearly delimit turns). Such

changes are even made necessary by the process of verbalization itself. The communicative situation changes with every single utterance, hence what is informatively relevant, and how it is relevant, must be under constant revision.

In many cases the information in the SN will be directly derived from the UI, yet it can also deviate from the information in the UI. It is the actual situation that determines which information becomes relevant, and how. The speaker not only has to take into account his own knowledge (present in his UI), but also situation-specific facts due to the concrete setting, and the knowledge the hearer might have (as represented in the speaker's PM - cf. 1.). In a conversation the composition of the SN will often be determined by the information on the state of affairs and the intention on the part of the interaction partner which appeared from his latest turn, even if there is a contrast with the information contained in the speaker's own UI. In a monologue (or a written text) the SN will more strongly correspond to the inherent characteristics of the information in the UI. But even then the speaker can make the information in the SN deviate from the information in his UI, under pressure from his social relationship with the hearer, or because certain types of information might be unfavorable in the light of the specific intentions of the speaker, or because he wants to mislead the hearer by providing wrong information (i.e. lying), etc.

(ii) Organizing the SN information-structurally

There is a growing awareness in the literature (also in FG - e.g. Bolkestein 1985, Hannay 1985, Siewierska 1987) that pragmatic functions even at a sentence level are strongly discourse-bound. Hence, the sentence-level pragmatic functions will have to be anchored at the level of discourse organization. Of course, this immediately leads us into a very tricky domain, about which there is much discussion (witness the huge amount of literature) and little consensus. At least the following distinctions seem necessary.

Discourse is based on the exchange of information on some 'theme' (also called 'discourse topic'), i.e. some state of affairs which is mutually known by or to be introduced between

speaker and hearer, and which is recognized as central to the current communicative situation. In the SN this central piece of information is marked as theme, and the different pieces of information related to it by the speaker as being relevant to the hearer are marked as rhematic (a survey of literature on the notions theme/rheme is to be found in in Lutz 1981). The theme/rheme distinction does not have to be a simple one. Alongside the theme there can be sub-themes, which at a certain moment are rhematic relative to the main theme, but which, after having been introduced, can become thematic relative to the other information in the SN (cf. the discussion in (i) concerning the position of the SN in larger texts).

The theme can behave in different ways in discourse. It can remain implicit; it can be introduced once or several times in individual utterances; the speaker can also mention it explicitly in a separate construction at the beginning of the turn (which might result in what is called a 'theme' in FG). The speaker's selection of one of these options will be influenced by whether he assumes that the hearer knows about the theme or that it is sufficiently prominent in the running discourse, and these observations suggest the introduction of at least one more type of pragmatic function at this level, viz. given/new (e.g. Prince 1981). The given/new status of information is a function of its degree of introduction in the running discourse, and hence in the UI of the interaction partners (presence in the encyclopedic knowledge is not sufficient: the knowledge has to be activated? - cf. Chafe 1976). The exact relationship between the values of the functions theme/rheme and given/new is not a priori evident.

These function categories can best be considered as gradual. This is certainly the case for the givenness/newness of information (Hannay 1985), and some type of quantification will have to be introduced to grasp this. While the theme itself is probably a rather absolute notion, the information attached to it might have to be marked in terms of gradual thematicity/rhematicity again.

Especially the givenness/newness of information is most probably constantly changing in the course of the verbalization of the turn. Once some piece of information from the SN has been communicated, it will acquire a much higher degree of givenness. But if

it is not mentioned again, its givenness can decline again in the course of the discourse. Etc.

Probably still other elements of pragmatic functionality[8] or related phenomena will have to be introduced at this level. One phenomenon which immediately comes to mind is some notion of the psychological 'saliency' of parts of the information for the speaker, in general, or specifically with respect to the present hearer, and independently of its givenness/newness or thematicity/rhematicity. (Some elements which might play a role here are discussed in Osgood 1980.)

(iii) Determining the status of the SN relative to the UI

The information in the SN does not exist in isolation, but relates in different ways to the interpreted reality of the interacting individuals. Successful communication requires that the speaker indicates this relationship. Sometimes the characterizations in this respect will be present in the encyclopedia of the speaker. But this is not necessarily the case. The speaker can decide hic et nunc that certain information has to be qualified in a certain way. He can be forced to introduce some qualification on the basis of information conveyed in the previous turn by the interaction partner. Or he can simply want to deviate from the qualifications present in the encyclopedia.

These characterizations are not always valid for the entire SN, for they can have scope over chunks of information of variable size within the SN. This implies that these characterizations will have to be organized in terms of various scope levels. And which characterizations are made at which level will depend on the degree of homogeneity of some chunk of information for the different dimensions involved. Sometimes all the basic units of information (cf. Nuyts 1989a, i.p.) will require separate characterization, sometimes one characterization can be given for a large chunk, with a contrastive marking at lower levels for those subsections of the information which deviate from the characterization at the higher level.

Without going into detail for each one, at least the following dimensions have to be distinguished (within each category, further subdivisions may be required).

(a) Qualification of the present occurrence of a state of affairs relative to some projected final state, i.e. its aspectivity. This can involve imperfectivity or perfectivity, but also inchoativity, continuativity, resultativity, terminativity, etc. This will mostly involve relatively small chunks of information, and will therefore usually be included among the information to be expressed within single utterances (for expressive devices for these and the following qualifications within individual utterances, see below). But it can also involve larger chunks of information, and this might lead to a separate expression in the turn entirely devoted to it (e.g. and this happened time and again, what this had to lead to is the following).

(b) Characterization in terms of the dimensions of space and time. As far as time is concerned, characterizations can be relative to the here and now of the communication, or relative to some deviant point on the time axis, and it can be in terms of 'on', 'before', or 'after'. They can be precise (e.g. in 1585) or vague (e.g. long before you were born). Characterizations in space can also be relative to the location of the speaker or relative to some location elsewhere in space, in terms of this location itself or of some point relative to this location. Both for time and space, expression can be in the form of a separate utterance in the turn, or as one among other elements of the information contained in one or more utterances in the turn.

(c) Qualification in terms of the likelihood or desirability of a state of affairs in the possible world under consideration. This involves a component of polarity: if the information in the SN is in conflict with the information in the UI, the problem of negation arises (cf. e.g. Horn 1978, Givón 1979). This also involves a component of modality: the state of affairs can be characterized in terms of the opinion of the speaker as to the likelihood of its realization or non-realization in the possible world (epistemic), or as to its desirability or non-desirability in the possible world (deontic). (On types of modality and their relationship, cf. e.g. Lyons 1977:787ff, De Schutter 1983, Palmer 1986, Hengeveld 1987a, 1987b, Nuyts 1988:708ff.) Both components interfere (Nuyts 1987, 1988, 1989b). Usually, polarity and modality will concern relatively small chunks of information, and they will find expres-

sion within the domain of singular utterances, but they can concern larger chunks and find expression in separate utterances assigning a polarity or modality value to the turn or large sections of it.

(d) Characterization in terms of the reality status of the information. Does it occur in the real world or in some other possible world (realis/irrealis)? Especially in the case of fictional information (fairy tales, invented stories, but also suppositions, etc.), this will have to be made explicit (if the speaker wants to be honest, of course). Again, this is possible by means of some explicit expression in the turn (imagine, once upon a time there was xyz, let's suppose that), or through markings in individual utterances in the turn. Characterization as fiction is also possible through special characterizations in the dimensions of time and space (this strategy is often used in e.g. fairy tales).

(e) Characterization of the information in terms of the source (often called evidentiality - cf. e.g. Chafe and Nichols (eds.) 1986). This applies among others if the speaker mentions knowledge, beliefs, opinions, etc. of some other person (cf. the 'layered dimension' discussed in Clark 1987). Correlated with this is the matter of direct or indirect quotation, 'erlebte Rede', etc.

(f) Characterization in terms of the strictly personal attitude of the speaker (for example emotional involvement in terms of degrees of positive or negative experience).

Though all of these are meta-level qualifications (operators, if you wish), they are not all of the same level. The exact hierarchy is open to further investigation (the ordering in the presentation above is but a vague and no doubt much too simplistic suggestion - a more substantial proposal is to be made in Nuyts and De Schutter i.p.; see also Nuyts i.p.). The rationale behind it might be: a qualification more inherent to the state of affairs is on a lower level than a qualification which is less information-inherent and more imposed upon the state of affairs by the speaker or the communicative situation. Thus, while time, aspect, and even more so space, are strongly related to the state of affairs itself, this is much less the case for modality or negation, and hardly at all for evidentiality and personal attitude. This

hierarchy seems to be reflected in the fact that higher level qualifications can (but do not have to) have scope over lower level ones, but not vice versa: a qualification in time or space can itself be qualified for modality or polarity, but not vice versa. There are also relations between some types of qualifications: e.g. modality/polarity and realis/irrealis are clearly semantically related; similarly, personal attitude certainly has relationships with epistemic and deontic modality. Quotation invokes a specific kind of problem, in that it can trigger embeddings of qualifications, as in (2).

(2) Maybe, yesterday John still believed that he could win

Though <u>believed</u> does express a modal qualification of a state of affairs, it does not express a modal qualification by the speaker. The speaker only reports on another person's opinion. That is why it can get a location in time, and a qualification in terms of modality by the speaker.

How these levels should be distinguished and related, and how they interfere with the problems of the scope of each qualification (mentioned above) is an object for further research. Inspiration may come from other proposals in the literature, including Lyons (1977), Johnson-Laird (1983), Foley and Van Valin (1984), Clark (1987), Hengeveld (1987a), (1987b), (1988)[9].

Probably, these qualifications also have to be marked in terms of pragmatic function categories. For example, negation and modality will often be very rhematic.

(iv) Filtering the SN

The choice of the rhematic information in the SN is, in principle, determined by considerations concerning adequacy, relevance, etc., i.e. matters of the type of Grice's (1975) maxims and developments of it (e.g. Levinson 1987). Obviously, this is once again strongly situation-bound. Normally the speaker will not want to provide the hearer with all information concerning the theme available in his UI, but only with the information required. Only the relevant information will be included in the SN. But even of this information he will not produce a complete verbalization: he will try to verbalize just enough to allow the hearer to infer the rest of the

relevant information.

Given his general knowledge of the world and a normal reasoning capacity, a language user is able to form a much more complete picture of the state of affairs communicated on the basis of a limited set of explicitly mentioned data. Cf. the phenomenon of 'bridging' - Clark (1977), Clark and Haviland (1977). Also the huge literature on implications, implicatures, presuppositions, background-information, inferencing, etc. can be brought to bear on this matter. The only difficulty is that the majority of this research has been conceived from the perspective of language understanding, and our knowledge of the speaker's strategies is very limited.

Anyway, profiting from this capacity, in composing and developing the SN, the speaker will eliminate, under the guidance of his PM, those elements of the information which can be inferred without having been verbalized explicitly. No doubt, these procedures will be in intimate interaction with the procedures determining the internal pragmatic functionality (theme/rheme, given/new, etc.) of the SN (cf. Clark and Haviland 1977). It will be much easier to eliminate thematic and given information than rhematic and new information. It is also likely that these filtering procedures can be applied in different stages of the process of the verbalization and production of the turn. For example, they will certainly be useful when selecting from the SN small chunks of information to be expressed in singular utterances (see below).

These procedures concerning the SN interfere in different ways with the question of correspondence of the information in the SN and the UI mentioned above. Consider lying. Direct lies occur when there is an apparent and deliberate mismatch between the information in the SN and the UI without the speaker indicating this (cf. the procedures under (i) and (iii)). Indirect lies occur when the speaker suggests information which does not correspond to the information in the UI by specifically combining facts to be mentioned explicitly and which in themselves do correspond to the information in the UI (cf. the procedures under (iv)), or when he leaves out information which in itself is strongly pragmatically marked (i.e. which is of crucial importance) in the given communicative situation (interaction of the procedures in (ii) and (iv)).

Or consider metaphor. While 'dead' metaphors (i.e. ones that are no longer consciously handled as metaphors) are no doubt integrated in the encyclopedia, a speaker can also creatively form metaphors. In that case, it involves a specific type of reconception of information from the UI in the SN (cf. the procedures under (i)). But such metaphorical representations will have a special status for the filtering procedures (as also for the procedures for assigning pragmatic functions), since a hearer cannot be assumed to be able to infer such creative representations on the basis of his knowledge and reasoning capacity.

(v) Determining the turn type

The SN as a whole has to be characterized for the type of turn the speaker wants to produce: is the purpose to inform the hearer, to persuade him, to elicit information from him, to narrate, to play language games, etc.? This is comparable to the characterization for illocutionary force at the utterance level, and no doubt there will be a correlation in that the decisions at this level will co-determine the decisions concerning illocutionary force at the utterance level. But the turn type will also influence the way the SN is subdivided into chunks for separate utterances, the linear ordering of the utterances, the explicitness of the information, the tone of the utterance (friendly, aggressive, impersonal, etc.), etc. Obviously, determining the turn type is, in the context of a running discourse, strongly correlated with the speaker's intentions, and often also with the type of turn the interaction partner has last uttered. Further analysis of the latter might profit from the many inquiries into speech act sequences (question-answer, comment-reply, etc.) (for references, cf. the literature on conversational organization quoted in (i)).

The SN (including the operations just mentioned) constitutes the conceptual structure on which the further production process builds. The information involved now has to be adapted and restructured to get it in the format of an actual utterance. In this process, one can roughly distinguish three successive sets of procedures, each using parts of the information specified in the SN and/or in procedures preceding them to transform the input

structure, viz. (i) a set of procedures responsible for 'sentencing', i.e. the rough conception of the chunks of information to be included in separate utterances; (ii) a set responsible for 'predication', i.e. the determination of the verbal pattern (the predication) able to represent the conceptualization; and (iii) a set responsible for 'expression', i.e. the realization of the predication in a surface structure.

3. FROM CONCEPTUALIZATION TO UTTERANCE

3.1. SENTENCING

With the discussion of sentencing, we enter the realm of the conception of individual utterances. (The elements involved in sentencing in FPG are comparable to Chafe's 1977a, 1977b conception of the process of verbalization.) Sentencing involves the construction of units of information of the size conceivable within one utterance. Such a unit we call a 'singular state of affairs' (SSA)[10]. Taking the step from the complex conceptualization in the SN to singular utterances, the procedures at this level have the task, not only to conceive each individual SSA, but also to characterize its proper status within the turn and to keep it in agreement with the other SSAs in the turn. They are responsible for appropriately integrating information in singular SSAs in view of the information in the SN to be expressed in related SSAs.

Of course, the impact of these procedures can seriously differ depending on the complexity of the SN, although the correlation does not have to be simple. As mentioned in 2., the SN does not have to be extensive, hence it will sometimes be possible to integrate all information in one SSA. Whether this is feasible and desirable is a decision to be taken at this level (in composing the SN the question how something can be expressed verbally is of no concern at all). Even for a simple chunk of information which could normally be expressed in one utterance, the speaker can nevertheless decide to spread it over a number of utterances. Similarly, he can decide to utter in one single utterance a more complex chunk of information which would normally be split up. These decisions can be situation-specific (e.g. determined by the supposed capabilities of the hearer), but are often also a matter

of style and habit (individual, or cultural - cf. the difference in complexity of an average German utterance as compared to an average English utterance). Anyway, it seems intuitively plausible to assume that as a general rule, the simpler the information in the SN, the simpler the application of the sentencing procedures.

We assume that the SSA is still a non-verbal, conceptual representation, but in conceiving it the speaker can already start taking into account the lexical possibilities of his language (including possibilities for extending predicate frames with satellites and for expressing meta-markers such as qualifications by grammatical means). This can influence decisions as to which conceptual elements may be combined in one SSA, and how this may be done. The insight that some chunk of information will be hard to express verbally might lead the speaker to adapt the conceptual structure in the SSA in order to facilitate verbalization. This could (e.g.) be in the form of introducing a comparison (there was an object there which was something like a chair), or a metaphorical relation (this is really a laughing painting, I can't call it anything else). Note that this implies that even at this level of processing a speaker can still reinterpret or modify information (cf. also Chafe 1977b).

One might wonder whether one should assume that a speaker can already select lexical items at this early stage, or rather has to postpone this till the moment he has to definitively shape his predication. Maybe both possibilities are available, depending on the circumstances. The latter is probably the default procedure, but the former might occur if the speaker absolutely insists on using some particular word, and makes the organization and verbalization of the rest of the information dependent on the possibility of including it.

Anyway, from this level on, procedures and representations will gradually become language-specific. Since the inventory of expressive devices is idiosyncratic for each language, we have to assume that the mechanisms leading to the selection of these expressive devices are language-specific too (though they must be based on universal principles, of course, in the same way as expressive devices are based on universal principles).

At least the following sets of procedures have to be postulated at this level.

(i) Determining the ordering of the SSAs

In conceiving SSAs, the speaker has to decide on how he can introduce some consecutive ordering in the complex of information in the SN. The possibilities in this respect are (alongside the procedures under (ii) below) crucial in determining which sub-chunks of information can be separated for inclusion in singular SSAs. And the decisions will result in a linear ordering of SSAs for consecutive verbalization and expression.

The two central factors determining the ordering procedures are the content of the information in the SN and the pragmatic-functional organization of the SN. There is large volume of literature which can be brought to bear on this matter (especially the former component - the latter is much less thoroughly investigated): for example the literature on the macro- and micro-structural organization of texts (especially of narratives) (this includes the research by Van Dijk and Kintsch referred to in 2., but also e.g. Rumelhart 1975, De Beaugrande 1980, 1984, Wilensky 1983, Mandler 1984, or Mann 1984, Mann and Thompson 1986, Thompson and Mann 1987 (rhetorical structure theory)), and the literature investigating the way in which speakers provide 'spatial descriptions' (e.g. of apartments, routes, etc.) (this includes Linde and Labov 1975, Klein 1979, 1980, Ullmer-Ehrich 1979, 1982, Levelt 1981, 1982a, 1982b).

One tendency is the deployment of information from thematic to rhematic and from given to new (though strong saliency of information can lead the speaker to deviate from this default procedure). Another tendency is to let the order correspond to the natural grouping and ordering of the information in the SN (i.e. a principle of iconicity - cf. Haiman (ed.) 1985). For example, a conceptual representation of a story in the UI will no doubt be organized in terms of a sequence of distinguishable and logically (causally, temporally, spatially) successive phases in the event, and in the default situation the speaker will respect this organization in grouping and linearizing SSAs. In describing an apartment, he normally starts from the door and 'walks' through the

apartment in some logical way. Even on a small scale, the unmarked expression of temporally ordered information follows the time sequence, that of causally related information the cause-effect chain, etc. (See also Osgood 1980, 1984.)

Of course, both factors mentioned can interfere, and sometimes the pragmatic-functional organization will force the speaker to deviate from logical order. In general, if the natural ordering of the information in UI and SN is not self-evident (i.e. inferable by the hearer), the speaker has to make it clear by introducing explicit markings in the individual SSAs. More marked orderings will require higher degrees of explicitness. Thus, in the case of completely natural ordering, the speaker can often omit any kind of explicit marking of logical relationship, while this will be largely impossible in the case of non-natural ordering.

Marking logical ordering entails making decisions concerning the connectives to be used, and hence at this level first decisions are made concerning the expression of related chunks of information in main/subordinate or coordinate clause combinations.

(ii) Relational organization of the information in the SSA

The information in each SSA has to be autonomously organizable, and the possibilities in this respect co-determine the way in which information in the SN is subdivided. We assume that the SSA is organized in terms of a relational structure involving a number of distinct roles (which will be realized as arguments and satellites in the utterance) and one central relator or relator-combination (which will lead to the choice of a predicate). (This is comparable to what Chafe (1977a), (1977b) calls 'propositionalizing' a conceptualization.) The speaker's choices in this respect depend on the inherent relation specifications in the SN (i.e. in terms of D-, H- and B-relators holding between concepts), and to a certain degree probably also on the pragmatic functions assigned to parts of the information in the SN (cf. (iii) below).

For example, consider again the conceptual network presented in (1) above. This relational network can be realized in quite different ways, depending on how it is embedded in some wider conceptual network. Let's suppose the speaker chooses the combination <D -> H> as central. Unless there is an indication who owns

the book (i.e. if it is left open how the H-relationship should be interpreted beyond purely physical possession), John will be characterized as agent, the book as object, and Mary as recipient. This could lead to the utterances John gives a book to Mary or Mary gets a book from John. If it were evident to the speaker that John is and remains the owner of the book, however, he might rather be characterized as source, and Mary as beneficiary. In addition, John could also be characterized as possessor, and the book as possessed, but this marking is only required if the possessive relationship has not yet been explicated in the context (which goes to show that role assignment at this level cannot be performed for SSAs in isolation, but has to be interactive with the information in the SN and the constitution of previous and following SSAs). If this relationship is made explicit, this could lead to the utterance John lends a book of his to Mary. If it is not, the result will be rather John lends a book to Mary. Still other situations occur when John donates the book to Mary, when Mary was the owner of the book and John only temporarily possessed it, when there is no physical transmission of the book from John to Mary, etc. Conceptual variation can be considerable and may involve rather subtle nuances. (This still relatively simple example clearly indicates the complexities that are involved in developing a strict formalism modelling language production.)

The exact requirements at this level (which roles ought to be distinguished, and how they ought to be represented) is a question open to further analysis. One possibility is the introduction of strict labels such as 'agent', 'object', etc. (i.e. case roles of the type proposed by Fillmore 1968). One could also conceive of these roles as a selective set of specified features (controller/controlled, causer/caused, etc.; cf. Nilsen 1972), to be assigned to entities on the basis of their status in a wider conceptual network. This matter cannot be separated from the question how a detailed representation of conceptualizations in SN, UI and encyclopedia will turn out, and which semantic functions will have to be assumed in the lexicon. Roles at this level can be considered channelizations of a multitude of very nuanced relational positions which entities can have in some wider conceptual framework, in the direction of a restricted number of more or less proto-

typical relational categories. In their turn, these categories can be mapped onto a strict set of semantic functions which play a role in the verbal patterns of natural languages (and of which the 'semantic function hierarchy' in FG is a hypothesis).

It is likely that the set of semantic functions at the level of the predication (the SFH) postulated in current FG can be considerably simplified within the present framework. Consider for example the different types of 'first arguments' which have to be postulated, such as 'agent', 'force', etc. (cf. Dik 1978: 36ff), and which appear to behave similarly in the verbal pattern. (See also Foley and Van Valin 1984: ch.2.) Probably the more detailed relational characterizations present in the SFH are only required at the level of conceptual representations in the SSAs, while at the predicational level it suffices to postulate a few functions which 'canalize' these different roles. (Obviously, the discussion in FG concerning types of states of affairs must be brought to bear on this level in FPG.)

One further element which must be accounted for in the internal organization of the SSA is the coreferentiality of entities which have already been introduced in earlier SSAs (anaphora), or will be introduced again in later SSAs (cataphora). This element is important in determining the definiteness of terms and for choosing full NPs, or anaphoric or cataphoric pronouns (and the pragmatic functionality of the information involved will play a role here, too - cf. Nuyts 1988: 542ff). (Relevant literature includes Chafe 1976, Bock and Engelkamp 1978, Hawkins 1978, Clark and Marshall 1981, Maes 1987.)

(iii) Organizing the SSA information-structurally

As mentioned above, an important element in deciding on the organization of SSAs is the pragmatic-functional status of the information in the SN. Information is normally deployed according to the principle of the gradual development of theme/rheme structure, with a more or less clear point of anchorage in given information and an extension in the direction of new information. This goes for the entire turn as well as for each singular SSA. Once a chunk of information has been introduced in some SSA, its status on the givenness/newness scale in the SN will change, and with it the

possibilities for further development of SSAs.

Information included in an SSA has to be marked for pragmatic functionality again, on the basis of its informational status in the SN and with respect to the SSA-internal situation. It is here that the values of topicality and focality enter the scene (to be seen as a scalar division, with the topic and the focus of the utterance-in-spe located at its extremities). Normally, topical information is given and/or thematic information in the SN, and focal information is new and/or rhematic and/or salient information in the SN. But the situation can no doubt be rather complicated. Pragmatic values at this level can be seen as a first canalization of the pragmatic-functional status of information in the SN, in view of processes to be applied later in the grammar. (Further canalizations, which can conform to the topic/focus distribution or can highlight different aspects of the information structure in the SN, will occur during lexicalization and syntactic function assignment.) Qualifications of information in the SN (cf. 2. (iii)) can also contribute to the topic/focus marking. Contrastive focus, for instance, is no doubt determined by characterization of information in the SN as being in conflict with information in the UI, i.e. it will often involve negation and/or modality (this information will also have strong rhematicity or newness in the SN itself).

Related to this domain is literature (in FG and elsewhere) concerning types of topic and focus, the discourse binding of pragmatic functions at the sentence level, and problems of topic continuity, topic shift, etc. (cf. e.g. Givón (ed.) 1983).

(iv) Determining the relation between SSA and SN/UI

A SSA must sometimes be qualified in terms of its status relative to the UI. This can be a rather complex matter. As mentioned in 2. (iii), qualifications in the SN relative to the UI can have a different scope, and therefore can be specified relative to qualifications with a wider scope in the SN. Obviously, in conceiving the individual SSA, a qualification will have to be introduced which corresponds to the qualification of the information in the SN, but which is also relative to the qualifications introduced in earlier SSAs, or in separate utterances specifically designed for marking

a set of following SSAs for some qualification, as in (3).

(3a) It was in 1898, on a cold winter night. ...
(3b) If you ask me, this is what I think of it. ...

After such qualifications, the information in following SSAs, if in accordance with the initial qualification, can remain unqualified itself. But if there is a SSA deviating from the overall qualification, it has to be marked explicitly (and no doubt this leads to pragmatic-functional prominence). Of course, qualifications of information in the SN can also be introduced in each single SSA. And a combination of both procedures is also possible: after (3a), for example, the speaker can recall the temporal situation of the event by using past tense forms in the expression of each following SSA (though he does not have to: he may choose the present tense as well). The range of possibilities and how they are realized for the different types of qualifications mentioned, in themselves and in mutual interaction, is unexplored territory for research.

Actually, the existence of utterances such as (3) demonstrates that the speaker has considerable flexibility in representing at this level the internal correlations of information in the SN. Apparently, qualifications can be represented independently of the information in their scope, although the relationship does have to be made explicit, of course, in order that the hearer be able to recover it. In (3) this is done by means of 'dummy' references (it in (3a), this in (3b)) to the state of affairs covered by the qualification and to be expressed in successive SSAs.

Possibilities for utterance-internal realization of meta-qualifications of SSAs are varied. Obviously this is language-specific, but in languages such as Dutch, German or English, at least the following possibilities (to be chosen at later levels, in the predication and expression components) are available. Time and space can be expressed in a satellite of the utterance. For space, this involves a very complex system of spatial adverbs (e.g. Von Stechow 1982) or terms with spatial prepositions (e.g. Cuyckens 1985, 1988). (See also Fillmore 1982, Klein 1982, Ullmer-Ehrich 1982.) For tense, expression involves temporal adverbs or particles (e.g. König 1979), or temporal prepositions (e.g. König

1974). (There also appears to be a great overlap in expression forms for time and space - see Traugott 1978.) If the temporal qualification is not too specific, it can also be expressed in the tense forms of the predicate (e.g. Wunderlich 1970, Kamp 1979, De Schutter 1981, Vet 1986). Aspectivity can be expressed in the aspect forms of the predicate (which are in complex interaction with the tense forms) (e.g. Comrie 1976), in adverbial satellites (repeatedly, finally, etc.), and occasionally in the choice of lexical alternatives (e.g. Dutch eten and opeten, resp. eat and eat all). Negation is typically expressed with particles such as not, no, never etc., but can also be expressed through the use of negative predicates (reject, be impossible, etc.). Modality has a variety of expressions (Palmer 1986), which, however, appear to be very similar for the different types of modality to be distinguished. They include modal auxiliaries, adverbs and particles, but also complex sentences with a 'propositional attitude predicate' (in the first person present tense or an impersonal form) in the main clause, expressing modality over the state of affairs expressed in the embedded clause (I believe that, it is possible that, etc.). (For references concerning negation and modality, see 2. (iii).) Realis/irrealis is expressed inter alia in tense forms of the predicate (e.g. the use of the preterite for irrealis - De Schutter 1981). The speaker's personal attitude is also frequently expressed by means of propositional attitude predicates (I hate it that, etc.), or through adverbs (damned etc.), the choice of lexical entries with specific connotative values, etc. Finally, source is often indicated again by means of complex constructions with a mental state or communication predicate in the third person in the main clause (John believes that, John claims that, etc.), but other possibilities include literal quotation, the use of moods of the predicate (e.g. the subjunctive in German), etc.

Actually, most of these qualifications can also be expressed term-internally, which is the case if they concern a concept or a conceptual network which is not the central one in the SSA but only a 'secondary' one to be expressed in some term attached to the main predicate. For example, absolute space is involved in the man from Jersey, and relative space in the farm next to the river or the biggest chair but one. Absolute time is expressed in the

one-o-clock news, relative time in the man who had arrived too late or a house as old as the street. Aspectivity is evidenced in the repeatedly blowing horn or the objective aimed at. Term-negation occurs in a non-specialist, modality in a possible failure. The fictional house expresses irreality. Personal attitude is involved in the damned pain. And indication of the source in a very brave dog, according to John.

Finally, it is important to be aware of the complex relationship between qualifications of information in SN and SSA and the pragmatic functionality of information in each of these domains. As mentioned above, modality and negation, for example, certainly have influence on the informational value of aspects of the conceptual state of affairs to be expressed. Hence, qualification in the SN no doubt influences pragmatic function assignment in the SSA. But it is also likely that meta-qualifications in the SSA are marked for pragmatic functions themselves (as was the case in the SN). This seems required to account for the differences in expression of the meta-qualifications in the SSA. The different expressions of modality and negation, for example, appear to be the result of their prominence in discourse (cf. Nuyts 1988: 718ff, 1989).

(v) Determining the illocutionary force of the SSA

Each singular SSA has to be assigned an illocutionary force, of course in function of the turn type (cf. 2. (v)) and the information present. But this relationship need not be simple. For instance, in a turn aiming to acquire information from the hearer (e.g. as a result of some 'gap' in the speaker's conceptual knowledge about a state of affairs), the speaker may have to form a series of statements to introduce the 'conceptual context' of the gap, which can finally lead to the formulation of a question indicating the gap itself. Hence, the determination of the illocutionary force of an SSA is also dependent on the exact nature of the information contained in the SSA (see also Nuyts i.p.).

There is reason to believe that even an SSA which is going to be expressed as a subordinate clause receives an illocutionary force. The difference between (4a-b),

(4a) It is not clear whether he has done it
(4b) It is not clear that he has done it

could be due to questioning illocution in the embedded clause in (4a) as opposed to declarative illocution in (4b). However, while the illocutionary force of an SSA to be realized as a main clause can be expressed in many ways, this is much less the case for embedded clauses[11].

The matter of illocution (a major topic of literature, including the entirety of speech act theory) is difficult to detach from matters of its expression: though the latter involves decisions to be made at lower levels in the grammar, it certainly also has impact on the exact way of characterizing the illocutionary force itself. There are at least two types of (nevertheless clearly related) problems, viz. the difference between primary and secondary forms of expression, and between direct and indirect forms of expression.

Primary or secondary expressions of illocution involve the question whether the set of procedures for expressing some 'prototypical' illocutionary force is used consistently or not. Consider the difference between (5a-b).

(5a) Are you going to Vienna this year?
(5b) You are going to Vienna this year?

(5a) is the prototypical expression for the illocution 'question' (i.e. a primary expression of a question), while (5b) combines the expressive devices of a question (the intonation) and a statement (the sentence pattern) in order to express that which is nevertheless also a question (i.e. a secondary expression of a question). Thus, in terms of expressive devices we can distinguish a number of 'prototypical' illocutions, which probably differ from language to language. For Dutch, English and German, e.g., there are only three: statement, question (involving two types, yes/no and question word question), and order. Apparently, statements can only occur with primary expressions. Questions and orders can also occur with secondary expressions. All other illocutionary forces may occur only with 'secondary' expressions[12].

The exact range of possibilities for mapping expression forms and illocutions is unclear. Often various secondary expressions can be used for what might be considered one illocution, often a

single secondary expression form can be used to express various illocutions. In some languages, the possibilities for creating nuance in expression are considerable. In Dutch and German for instance, the use of particles such as maar, wel, and eens or aber, wohl and mal allows the speaker to express an enormous range of illocutionary variants. How the speaker decides in these matters is an open question. But among the influencing factors, there appears to be not only the exact value of the illocution, and its intensity (obviously, illocutionary forces can be strong or weak), but also the characterization of the information in the SSA in terms of modality and probably other qualifications. The difference between (5a) and (5b) above, for instance, is clearly due to the degree to which the speaker has an opinion about the chances that the person questioned will go to Vienna. (5a) does not entail a priori assumptions, while (5b) suggests that the speaker estimates the chances of receiving a positive answer to be high.

The distinction between direct and indirect expressions of an illocutionary force involves the question whether the speaker uses procedures inherent to the illocution to be expressed at all, or rather applies a set of procedures which are 'normally' used for the expression of a different illocution. The classical example of a direct/indirect pair is (6).

(6a) Give me the sugar
(6b) Could you give me the sugar (please)?

Here too, the procedures determining the relationship between the illocution and the expression which is chosen are unknown. It is certain, however, that the speaker's knowledge of the situation, and particularly of the social context, will be decisive in motivating the choice: the difference between (6a) and (6b) is obviously a matter of politeness.

Performatives are a separate kind of problem. Performative expression of an illocution seems rather exceptional (cf. Weijdema et al. 1982), and the conditions for its occurrence are not always obvious. Its selection is likely to be an indication of the importance of the SSA and its realization in terms of the illocutionary force, and thus of the intensity of the illocution. (7), for example,

(7) I ask you (earnestly) to close the door

is usually a repeated request stressing that the speaker considers it important that the act requested be performed. The relationship between the performative verb chosen and the illocution intended is not necessarily simple. Though (8) suggests a simple statement, it can be used as a warning or an order.

(8) I tell you not to go

Predicates occurring as performatives can obviously also be used non-performatively, e.g. in meta-communicative or meta-linguistic utterances. In this case they involve some aspect of the information contained in the SSA (including qualifications), but not the matter of its illocutionary force. It is not always obvious whether a predicate is being used performatively or not. The examples in (9) are unclear. (9a) is rather performative, whereas (9b) (which involves modality) is not.

(9a) May I ask you to close the door?
(9b) Let's say he is sick (though this is disputable)

3.2. PREDICATION

With the sentencing procedures we have passed the gradation from the utterance-independent to the utterance-specific representation of information, and the next step to be taken is to decide how to represent it verbally, i.e. how to lexicalize the conceptual information. We now enter the realm of FG, and in the following I will mainly restrict my discussion to elements of FPG which are responsible for transposing SSAs into predications, and to elements in which FPG differs from FG.

From this level on, processes basically concentrate on the further development of individual utterances. This does not mean that the way earlier SSAs have been formulated cannot be of influence. It may be stylistically important to limit the reoccurrence of lexical forms in successive utterances, and this necessitates access to lexical choices made in earlier utterances. The previous utterance of the interaction partner in short turn-taking sequences can also play a role here - on syntactic correspondence in question-answer sequences, cf. e.g. Collier (1983). But apart

from such matters, the utterance can be considered a separately processable entity from here on. Which is not to say that it can be processed autonomously or in isolation. The speaker's knowledge of the communicative factors in the UI certainly remains influential. For example, an important element in selecting lexical items is the speaker's evaluation of the social context, since this strongly determines the register he may use (cf. the difference between hey pal, gimme a smoke, will you? and I am sorry sir, but could you lend me a cigarette, please?; or the wide variety of forms of address in languages such as Japanese, all with different politeness values). Hence, even at this level processes remain interactive and non-automatic (cf. 1.).

The processing unit at this level is the sentence. This may be a complex sentence, though not all complex sentences require an integrated treatment. As mentioned in 3.1 (i), the selection of a coordinate or subordinate relationship between sentences can already be made at the level of the linearization of 'raw' SSAs. (10) is certainly an example of the latter,

(10) Before going to bed, he always takes a walk in the garden

and the SSAs involved may be handled in a relatively independent way (though the procedures must obviously take into account the status as main or subordinate sentence). Complex utterances such as (9), however, or combinations of main clause and relative clause (certain types at least), do constitute a more integrated complex, and must therefore be considered as one unit at this level (i.e. they should rather be considered as rooted in one single SSA). (Observations on different degrees of cohesion between the components of complex sentences, e.g. by Foley and Van Valin (1984), or within FG by Hannay and Vester (1987), fit nicely within this discussion.)

At least the following sets of procedures, leading to the introduction of the different elements in the FG-predication, have to be accepted at this level.

(i) Choosing a predicate and terms

In lexicalizing an SSA, the speaker must first choose a predicate. This choice is determined in the first place by the need to appro-

priately bind all the roles occurring in the SSA, including the possibility of having certain roles within, and other roles outside the central relationship (i.e. as arguments and satellites, respectively). Further determining factors are: the pragmatic functionality of the roles and the possibilities offered by certain predicates to translate this into structural prominence (cf. e.g. the difference between give and get, the former giving more prominence to the agent, the latter to the recipient - see Nuyts 1988: 590ff, 1989a, i.p.); the meta-qualifications of the SSA (e.g. the choice between alternatives with different connotative values depending on the personal attitude of the speaker, or between a positive or a negative predicate due to the polarity of the SSA); and elements of the conception of the communicative situation in the UI (matters of register, politeness, etc. as indicated above). Elements of the qualification of the SSA or its illocutionary force can also, in function of their prominence, lead to the construction of complex sentence types with performatives or propositional attitude predicates.

The choice of a predicate can be a direct mapping of some conceptual relator, as in the utterance a chair has four legs. But in many cases it implies that a complex of conceptual relators is 'clustered', as in the mapping from (1) to the predicates give or get. It is also possible to combine conceptual nodes and relators in the predicate, as in walking, which could also be expressed in more direct correspondence to the conceptual representation as take a walk. These choices often involve predicate formation procedures causing, for example, argument reduction, if this is necessary from the perspective of the number of roles to be bound by the predicate. (Dik 1980a: 39ff also proposes a predicate formation rule for a number of cases which in FPG-terms involve incorporation of an entity and a relation.)

As mentioned in 1., FPG follows the FG-approach to predicate formation. Within this wider framework, however, these processes can and have to be made sensitive to characteristics of the input structure or to external information, while in traditional FG they operate 'out of the blue'. It is possible that individual cases of predicate formation proposed in FG will have to be handled differently in this wider framework, but this problem deserves closer

examination.

Interactively with the choice of a predicate, terms are formed to express the various roles in the SSA, together with the secondary relations attached to them. This involves assigning a categorial status to entities. This cannot be done in isolation for each entity: assignment of a categorial status to one entity can influence the possibilities for assigning a categorial status to other entities. An important determining factor is which entity has been assigned a central role in the SSA: normally, this entity occurs as head of the term, and one can assume that this serves as the starting point for categorizing the other entities in the SSA. The processes which must be assumed here are open to further investigation. As to the structure of terms, FPG follows the FG-treatment.

Another decision to be made in forming terms at this level is how to express coreferentiality. Should one use full NPs or pronouns, anaphoric or cataphoric, etc.? Furthermore, it is also possible to select modal adverbs, modal and other particles, etc., as a (partial) expression of different kinds of qualifications of the SSA mentioned above.

Depending on the number of terms formed, and the predicate's ability to bind these terms in argument positions, the predicate frame can be expanded with a number of satellites, as is assumed in FG. Term-insertion in argument positions implies, then, that the role of the entities involved is further 'canalized' in (or 'forced into the shackles of') the semantic function of these positions (cf. 3.1 (ii)), while the role or status (in the case of qualifications) of elements introduced in satellite positions is retained. It is important to keep in mind the difference suggested above between roles and semantic functions. The latter only determine the relationships between the elements occurring in the core predication in correlation with the predicate. The former determine the position of an entity within the entire SSA. The step from role to semantic function, therefore, implies that part of the relational value of the role is lost (thus roles like 'force' and 'agent' can be narrowed to a 'first argument' having the semantic function of 'actor' or something like that). In the case of satellites, no narrowing of the role occurs.

It is imaginable that the speaker, while inserting the terms formed into the argument positions of the predicate chosen, must conclude that the role of some term does not fit the semantic function of the argument positions. In that case he must reconceive the SSA, or change his choice of a predicate, or produce a weird utterance (which might under circumstances be taken as metaphorical, even though unwanted).

(ii) Determining predicate and term operators

In the predication chosen, the speaker must also specify operators for further expression of qualifications of the SSA and the illocution. In as far as the qualifications did not find expression in the lexicalization itself, they require expression through function words and grammatical forms in the expression component. With respect to types and ways of representing these operators, we do subscribe to the principle recently introduced in FG (Hengeveld 1988) that there must be layers (see also Foley and Van Valin 1984) relating to the hierarchical ordering of the qualifications in SN and SSA. Yet, there may be reasons to deviate from the way layering is currently realized in FG (cf. note 9). But this is a topic for future research. Concerning the expression of illocutionary force, however, it should be mentioned here that the 'illocutionary operator' is better called a 'sentence-type operator' (declarative, imperative, interrogative), as this is precisely what the operator stands for in Dik's (i.p.) analysis. The principle of 'illocutionary conversion' introduced by Dik (i.p.) is not required in FPG. Not only is it theoretically problematic since it introduces a principle of interpretation in a language production system (Nuyts 1988:522ff), but the principle is even superfluous as illocutionary force is fully specified at the level of sentencing, and determines the entire set of expressive devices, of which the sentence type is but one.

Again, the FPG-approach has the advantage that it allows one to explicitly indicate the factors which determine the assignment of term and predicate operators such as tense, aspect, mood, definiteness, while in FG they are assigned at random. This will not be an easy task, however. There are often very complex mapping relations between conceptual factors such as meta-qualifications

and illocution, and certain operators. For example, the mood-operator may at least be determined both by modality and illocution (Lyons 1977). The tense and aspect systems of the predicate are closely related (e.g. Comrie 1976, Vet 1981), and are often hard to distinguish in their functions. The tense operator is, moreover, co-determined by a factor such as realis/irrealis. (On the complex factors determining tense, see also De Schutter 1981, Vet 1986.) Etc.

(iii) Syntactic function assignment

Finally, syntactic function marking must be added to the predication (at least in those languages in which they can be assumed to exist). It is intuitively plausible to consider this a matter of the introduction of a perspective in the SSA, as is claimed in FG. But in FPG, 'perspective' is no longer a primitive notion. It is a complex and derivative concept determined by a number of factors, among others including the pragmatic functionality and the relational value of terms. The latter factor is explicitly recognized in FG, since syntactic function assignment is directly correlated with the semantic function hierarchy. But it is also generally recognized (also in FG-publications - e.g. Bolkestein 1985) that subject and topic often coincide, and that object-assignment to the second or third argument is determined by the degree of topicality of each (Nuyts 1988: 539ff). Probably, factors of thematicity and saliency in the SN also exert an influence. Hence, syntactic function assignment can also be considered a further means of expressing the pragmatic functional value of information in the SN.

One is also lead to ask why only one object should be distinguished (as in FG), rather than two (as in much of the syntactic literature, including relational grammar). From a theoretical perspective it seems reasonable to claim that all real arguments of a predication must have their share in the perspectivization of the utterance (a line is traced throughout the entire core predication, as is the case with all other function markings), and therefore must be assigned a syntactic status. The disadvantages of introducing a second object function are not obvious, but again, further research seems required.

3.3. EXPRESSION

Ultimately, we have reached what is traditionally called the syntactic component of the grammar. FPG largely accepts the (albeit still very vague) overall design of the systems involved here in FG, and I will not further comment on this here, except for some minor remarks.

Firstly, in current FG the role of intonation has no doubt been neglected. Intonation is at least as important an expressive device for the pragmatic functionality of information in the SSA as word order, and there is a very subtle interaction between word order and intonation to reach a nuanced expression of the informative status of different parts of the utterance. It is highly unlikely that one will ever be able to accurately handle the relationship between informational status and word order of terms, without considering the speaker's options in the domain of intonation. (See Bolinger 1978, 1983; or, concerning FG, Van Buuren 1985.[13] Suggestions for anchoring intonation in a language production model are to be found in Van Wijk and Kempen 1985, although the input of pragmatic-functional factors to the process will have to be much stronger than they concede.)

Secondly, either within the expression component, or in the area bordering the expression component and a still-to-be-introduced 'articulation component' (i.e. that which is traditionally referred to as a phonological/phonetic component), there has to be a location where the phonologization of the lexical items chosen can take place (should one want to take into account the evidence for such a process - see 1.). Introducing these procedures will depend on the further development of a number of the subprocedures of the expression component, viz. the morphological processes which interfere with phonological processes. In any case, phonologization is a matter to be located as late as possible in the grammar. (There are some very brief ideas on the phonological component of a grammar in Nuyts 1982, 1983.)

NOTES

1. FPG was first introduced in De Schutter and Nuyts (1983) and somewhat modified in Nuyts (1985), (1988). The present outline corresponds to the one in Nuyts (1988), which slightly differs from the previous ones. Still, large parts directly go back to the original presentation developed jointly with Georges De Schutter.

2. For a proposal developed in artificial intelligence, which in its overall organization is quite comparable to the present one, see Hovy and Schank (1984).

3. Osgood (1980), (1984) presents the verbalization process as a matter of decoding, and language understanding as a matter of encoding. This is illogical, however: it is natural to consider a lexical pattern as a symbol representing a meaning, and not the other way around.

4. See also Nuyts (1984), (1988: 190ff). I will not be concerned here with the problem of how to represent these cognitive factors in the model - there are some suggestions in Nuyts (1988: 558ff).

5. Though one does not have to agree with the overstated conclusions which he links to his considerations, that the 'grammatical paradigm' should be abandoned altogether.

6. Incidentally, one does not have to agree with the tendency existing in many models of language production to make a sharp distinction between the speaker's determination what to say, and his determination how to say it. In FPG, there is a gradual movement from the former to the latter, and it is often hard to say which of them is involved.

7. This shows the relevance of theoretically distinguishing between an encyclopedia (i.e. the entire stock of knowledge possessed by a language user) and the UI (i.e. the part of the encyclopedia which is activated in a specific situation).

8. Henceforth, the term 'pragmatic-functional(ity)' is used to refer to all those aspects in the grammar which are related to information-structural notions such as theme/rheme, given/new, salience, or topic/focus (to be introduced later in the grammar), i.e. matters related to the 'pragmatic functions' in FG.

9. The FPG-treatment of 'layering' is markedly different from Hengeveld's proposal within FG. Explicit discussion is for another occasion. See also Nuyts (1988: 711ff), (i.p.) for some comments.

10. In De Schutter and Nuyts (1983) we have simply called this 'state of affairs'. This term is too often used in a more

general sense (as I have done above) to warrant unequivocality, however.

11. This corresponds to the general picture of the syntactic stiffness of embedded utterances in our languages. Cf. e.g. Givón (1979) for further examples concerning the expression of pragmatic functionality in the embedded clause.

12. Of course, this sounds a bit strange for they do not have a 'primary' expression form at all.

13. There is also a section on intonation in the most recent version of Dik (i.p.), yet I did not have the chance to consult it.

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