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A Functional Model of Referential Processes¹

0. Introduction

Findings in the field of the didactics of English indicate that the correct use of the articles in English confronts learners including advanced students of English, with considerable difficulties. The contrastive-normative approach commonly presented in (school-) grammars does not result in the desired success. An earlier version of the functional model of referential processes presented below (Klages-Kubitzki, 1995) provided the basis for the definition of distinct operations, which help to establish a network of if ... then-relationships by making the particular signalling function of any one expression explicit. These operations were then translated into instructions for article usage. However, further analysis of the original model has revealed certain inconsistencies with regard to the functional level or dimension of the defined operations. This paper thus presents a revised version of the original model based on a reconsideration of the term operators introduced in *The Theory of Functional Grammar* (Dik 1989). Our analysis, which focusses on the semantic operations involved in referential processes, leads to a modified concept of underlying clause structure.

The model of underlying clause structure Dik (1989) presents distinguishes several levels or "layers" of formal and semantic organization. This complex abstract structure

...is mapped onto the actual form of the corresponding linguistic expression by a system of *expression rules*, which determine the form, the order, and the intonation pattern of the constituents of the underlying clause structure (1989:45).

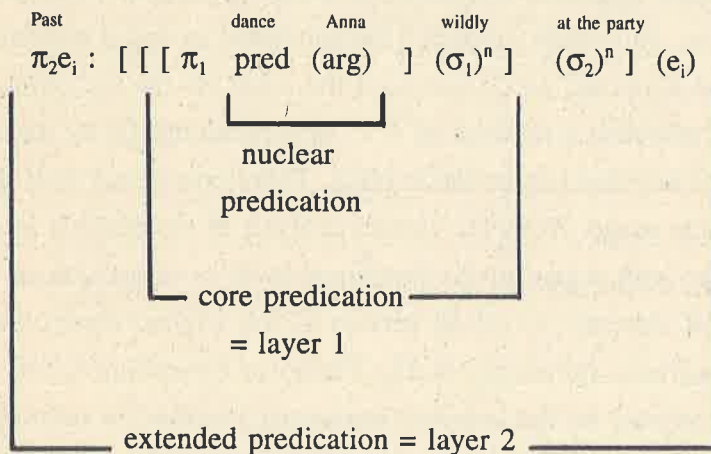
He continues

¹The present text is a slightly adapted version of a paper read at the 3rd ESSE Conference, Glasgow 8-12 September 1995. I would like to express my thanks to Wolf-Dietrich Bald, Lachlan Mackenzie and Peter van Baarle for valuable comments on earlier versions of this paper.

[A]s far as content is concerned, underlying clause structure only contains ... lexical items and combinations of lexical items ... [A]ll the elements in the underlying clause structure which have some influence on the form of the constituents will be treated as *morpho-syntactic* operators; this includes both the operators and the [semantic, syntactic, and pragmatic] functions in underlying clause structure (1989:61).

As our analysis will show, neither the meaning definitions of individual lexical items nor the morpho-syntactic operators proposed by Dik sufficiently account for the semantics of article usage and its impact on the morpho-syntactic structure of a clause. The operations here involved differ from Dik's (π -) operators in that they capture a number of crucial distinctions and apply to more than one semantic domain (cf. Dik 1989:138). Our discussion departs from Dik's representation of underlying clause structure (fig. 1).

(1) Representation of underlying clause structure (Dik 1989)



with

- pred = predicate
- (arg)ⁿ = argument(s) made up of terms (term structures)
- π_1 = predicate operator(s)
- σ_1 = Level 1 satellite(s)
- π_2 = predication operator(s)
- σ_2 = Level 2 satellite(s)
- e_i = variable symbolizing the SoA involved

Of particular interest are the term operators generic, paraphrased as "reference to any arbitrary [token]" vs. specific, paraphrased as "reference to a particular [token]"; and definite, paraphrased as an "identify"-instruction vs. indefinite, paraphrased as an "construe"-instruction.

1. Genericity

Dik admits the operators representing the specific/generic distinction only insofar as there are grammatical phenomena sensitive to this distinction (e.g. differences in paraphrase potential). Though Dik recognizes the obvious significance of the distinction to semantics and to the logic of language, it is implied that a possible pragmatic significance is not relevant to his notion of grammar (1989:145). Thus, he argues that, e.g. *If you feel lonely you could buy a dog* contains the "g"-operator and receives its (pragmatic) non-specific reading only in the context of a non-generic predication. It is implied that the type of generic interpretation - "truly" generic vs. "non-specific" generic - is ultimately determined by the genericity of the predication. Hence, a second (pragmatic) genericity-operator located on the level of the predication is implied. As this solution appears unsatisfactory we propose a different interpretation.

In accordance with the rule that the layers of the underlying clause structure and the corresponding operators are hierarchically related (cf. Hengeveld 1989) the operator determining the genericity of a predication must dominate the π_2 -operators. These are related to such phenomena as Tense and Objective Modality (cf. Dik 1989:202), some of which receive a modified expression in generic predications. Thus, under the influence of the GENERIC operator the tense and/or aspect of the predicate is changed into simple present or a different tense if specific semantic features attached to the predicate (e.g. [-true in the present]) cause the tense to be shifted to simple past (fig. 2).

- (2) a. A squid lives on seaweed. ([+true in the present])
 = GENERIC [Pres [live on_v (x₁:squid_N (x₁))
 (x₂:seaweed_N (x₂))]]
- b. The dodo ate figs. ([-true in the present] since the
 species is extinct)
 = GENERIC [Past [eat_v (x₁:dodo_N (x₁)) (x₂:fig_N (x₂))]]

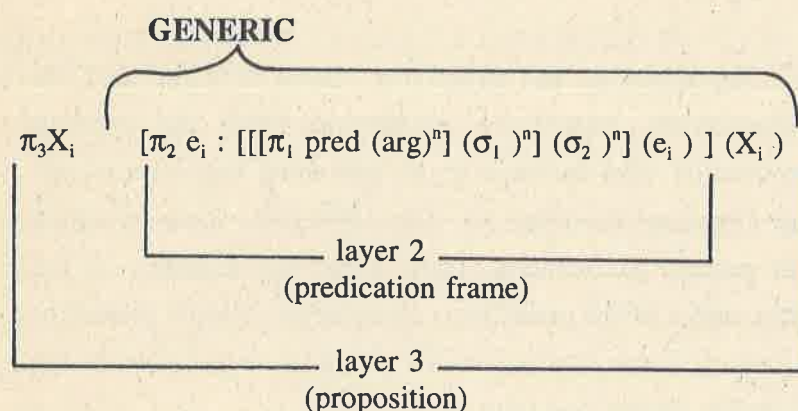
In each case the predicate is furnished with the (additional) feature [+ stative], which corresponds to [-dyn; -con] in Dik's terms of semantic SoA-parameters. Thus, the predication becomes the expression of a defining property, with the first argument now denoting the defined class, species, type etc.. Under the influence of GENERIC and due to the resulting static quality of the predication the semantic function of the first argument automatically converts to Zero (\emptyset).

These findings lead to the following two conclusions:

(i). The GENERIC-operator cannot be associated with the terms or any other layer-1-structure(s). Rather, it must be located on the layer of the predication taking all of layer 2 in its scope.

(ii). In order to account for its semantic influence (influence on morpho-syntactic operators, semantic function and truth value [+/- true in the present]) GENERIC is seen as operating in another dimension, thus appearing "above" Dik's linear arrangement of underlying clause structure (fig. 3).

(3) The position of GENERIC within the underlying clause structure



Now the question remains as to the location of the specificity operator and its relation to the second set of term operators under investigation, namely "definiteness" and "indefiniteness".

2. Specificity with relation to definiteness/indefiniteness

Following the analysis presented in Quirk *et al.* (CGEL) (1985:5.26, p. 265), specific reference may be considered the standard form of reference assigned to definite and indefinite noun phrases as long as a particular referent is intended. Non-specific reference, *i.e.* reference to an arbitrary referent, we will exclude from our considerations because of its dependence on the semantics of the predicate (cf. "intensional verbs" in Givón 1978:293f.) and/or pragmatic considerations. On the level of expression, the indefinite article appears whenever certain contextual conditions for use of the definite article do not apply (cf. CGEL 5.28-5.35,

Hawkins 1978, Dik 1989:139ff.). It may thus be regarded as the unmarked article. The use of the definite article, on the other hand, depends on the influence of additional contextual factors and appears as a function of a MARKED SPECIFICATION-(MSPEC)-operation as opposed to a DIFFERENTIATION-(DIFF-)-operation as we define it:

(i). Nouns referring to entities which may be quantified but which appear in an unspecified context represent the expression of a term whose form of realization is subject to the term-operator DIFFERENTIATION (DIFF) (fig. 4):

(4) John drove **a car**.
 = π_1 [AGENT_(x1) ; GOAL_(x2) [drive_v (x₁:John_N (x₁)) (DIFF1x₂:car_N (x₂))]].²

The term appears as an undetermined noun (*Symbolwort*), which in the absence of any quantifying term-operators is quantified by means of the indefinite article in the sense of "at least one" (cf. VATER 1984). Noun plus indefinite article signals to the addressee that the referent is a (particular) token of the kind defined by the semantic features of the noun. The term "DIFFERENTIATION" has been chosen to indicate that the intended referent is not an abstract, indivisible (and thus uncountable) whole. Rather, the referent is "one" particular entity which, however, cannot be located by the addressee. The function of DIFF therefore resembles that of the indefinite operator in Dik. To avoid the danger of terminological misunderstandings and ambiguities DIFFERENTIATION is preferred to Dik's terminology. As an operator of the lowest layer in the structural hierarchy (layer 0: predicate and terms) DIFF is subject to the influence of higher-level operators.

(ii). If certain contextual requirements are fulfilled, a term may in addition be subject to the operator MARKED SPECIFICATION (MSPEC) (fig. 5):

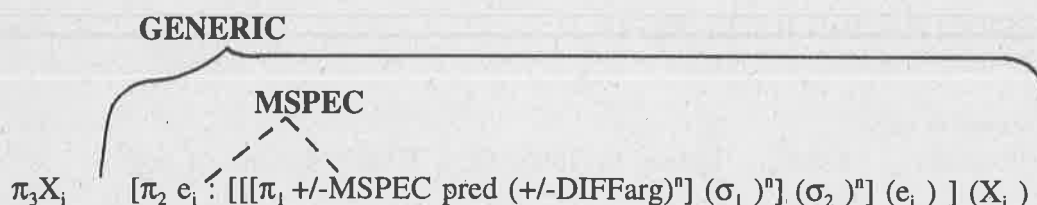
(5) John drove **the car**.
 = π_1 [AGENT_(x1) ; MSPEC-GOAL_(x2) [drive_v (x₁:John_N (x₁)) (DIFF1x₂:car_N (x₂))]].

Under these conditions, the intended referent acquires the feature [inclusiveness of reference], referred to by Dik as "implicature of identifiability". On the expression level MSPEC is responsible for the use of the definite article. Its function therefore resembles that of DIK's

²According to Dik (1989:68f.) the predicate frame determines the semantic function(s) of the argument(s). The question remains, how in view of a number of possible functions (e.g. Goal, Source, Direction for *drive*) a particular function is assigned. We assume that a second set of semantic operators is responsible for the selection of the relevant semantic functions in a given predication. Though our work on semantic (function) operators is still in progress we suggest to specify them before the predicate itself (predicate frame operators). We use capital letters to indicate our deviation from Dik's analysis.

definite operator with an important difference in the level of operation: While DIK associates the *definite operator* with terms, MSPEC is located on a superordinate level, as MSPEC may be activated only in the presence of other contextual and/or predicate frame-related factors (fig. 6).

(6) The location of DIFF and MSPEC within the underlying clause structure



However, as fig. 6 indicates, a new problem arises. If MSPEC represents a layer 1-structure the question remains in what way it accounts for operations relating to layer 2-satellites in particular. Similar to GENERIC, MSPEC appears to function in another dimension of underlying clause structure in that it modifies the semantic and especially the referential properties of a term.

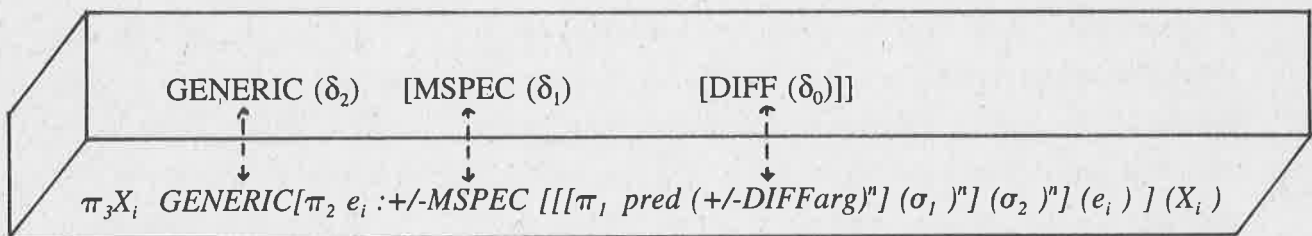
We therefore propose to define a new class of operators, semantic operators (δ), which represent the functions expressed by the articles and other closed class items (e.g. prepositions). Though "semantic" may appear as not perfectly appropriate in the present context, it serves best to capture the crucial differences that distinguish δ -elements from Dik's notion of morpho-syntactic operators, which are grammatically rather than lexically expressed (Dik 1989:138). δ -operators, in contrast, may well be responsible for extended linguistic expressions (e.g. the addition of postmodifications in the presence of MSPEC). Furthermore, δ -elements may even affect the meaning definition(s) of individual lexical items (e.g. truth value) as well as change the semantic function(s) of one and possibly more arguments in a given predication (e.g. in the presence of GENERIC). Though each semantic operator is associated with a particular grammatical form of expression, it most typically represents a characteristic arrangement of the affected or related lexical items. GENERIC, for instance, may lead to inflectional modifications, which, however, do not bear a 1:1-relationship to the presence of this particular operator the way the presence of a morpho-syntactic operator representing e.g. a Phrasal Aspect-distinction is expressed by one particular form of inflection.

Rather than representing exclusively forms belonging to closed paradigms, e.g. form words such as articles, δ -elements serve to distinguish the referential properties of a given

predication as it appears in its specific linguistic and interpersonal context. They represent the quality and relative quantity of information on the basis of which the hearer is implicitly instructed to look for the most relevant or most accessible representation fitting the description (cf. Rouchota 1994:452ff.). "Quality" here refers to the semantic features typically associated with the terms involved in the expression of a particular kind of semantic operation, e.g. semantic function and truth conditions for GENERIC, [inclusiveness of reference] or [guaranteed accessibility] for MSPEC, [countability] or [divisibility] for DIFF. "Relative quantity" accounts for the fact that an operator like e.g. MSPEC is expressed by the definite article plus contextual information, which, unless provided by the "semantics" of the situational context, is lexically expressed in the linguistic context of the utterance. Consequently, the use of the definite article in, for example, *John saw the elephant* indicates the referential quality ([accessibility]) expressed by the utterance. Due to the underlying MSPEC-operation, however, the hearer/reader will search the (linguistic) context for the appropriate quantity of specifying information the presence of which the speaker/writer has indicated by the use of the definite article. If the speaker fails to provide the necessary context (s)he has violated the rules for the expression of MSPEC. We therefore regard an isolated expression such as *John saw the elephant* as an incomplete expression of an MSPEC-operation.

The high degree of functional complexity distinguishes δ -operators from morpho-syntactic operators which "typically capture a limited number of crucial distinctions in some semantic domain" (Dik 1989:138). The relationship between these different types of structures becomes clearer if we adopt a "box-model" of underlying clause structure (fig. 7).

(7) A "box-model" of underlying clause structure



The sides of the box represent different dimensions (morpho-syntactic vs. semantic-referential) of hierarchically structured functional relationships. Interconnections between different dimensions are possible on corresponding layers, thus forming a three-dimensional body of underlying clause structure.

3. Semantic function and semantic operations

The notion of semantic operations implies a functional relation between grammaticality and the semantics of articles and, as can be shown, prepositions. There is some evidence that all semantic functions except Goal contain an implied preposition (e.g. *by* for Agent, *to* for Direction). The grammatical import of the semantic functions expressed by (implied) prepositions becomes apparent in connection with our analysis of referential processes. For every preposition there appears to exist one (or possibly two) basic semantic function(s), e.g. *at*: spatial/temporal Location; *in*: spatial/temporal Location; *on*: spatial/temporal Location. The use of an article after the preposition indicates to the addressee that in this particular context the preposition is to be understood in its basic semantic function. However, there are a number of constructions, usually treated as idioms or figures of speech, which typically appear without an article (e.g. *in contrast* ≠Location, *at school* ≠Location, *on sale* ≠Location). Here, the basic function appears to be transferred to a secondary, quasi-metaphorical function, which is indicated by the lack of any article. The addressee is instructed to find a transferred interpretation that plausibly functions within the context of a CLASSIFICATION-(CLASSIF)-operation. Once an expression has been submitted to a CLASSIFICATION-(CLASSIF)-operation it serves to classify, that is, define or specify the properties of another constituent (fig. 8).

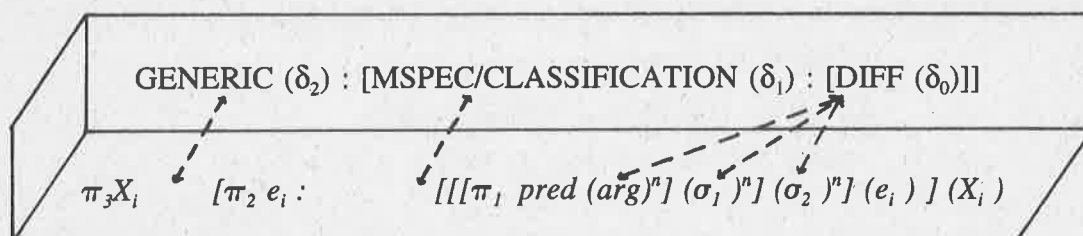
- (8) They met **at university**.
- Classification of the first argument:
They were students. OR
 - Classification of time (predicate):
 ...**when they were students.**

In accordance with Rouchota's relevance-theoretic account of attributive, specific and referential interpretations of indefinite NPs we interpret *at university* (*at school*, *on sale*) as referential. We have to assume that the speaker has a particular entity in mind, otherwise the indefinite description would fail to make a crucial (here: classifying) contribution to the way the utterance achieves relevance (cf. Rouchota 1994:460), e.g. ...*when they were students* [*at the same university*].

Though we have not yet thoroughly analysed the exact properties of the CLASSIFICATION-operation it may be assumed that it belongs to the class of δ_1 -operators, parallel to MSPEC. Similar to MSPEC, CLASSIFICATION appears as a supplement to the semantic term-operator determining the semantic function of an argument or satellite. As its scope of

operation extends to layer 2-satellites (e.g. "I learned Latin **at school**") CLASSIF, too, needs to be excluded from the level of the predicate frame. Thus, our model now looks as follows (fig. 9).

(9) Location of the CLASSIFICATION-operator involved in referential processes



4. "Generically referring" noun phrases, bare plurals and collective nouns

With the exception of prepositional phrases, our analysis has not yet considered the cases in which the noun phrase is realized without any article as in fig. 10:

- (10)
- a. **John** drives a Volvo.
 - b. John studied **philosophy**.
 - c. John is **president**.
 - d. We saw **dogs** in the garden.
 - e. **Dogs** are faithful pets.
 - f. I like to drink **wine**.

According to our analysis (10a) represents a generic predication. Since we have argued that the concept of genericity cannot be applied to individual terms, we cannot assign generic reference to the noun phrase in subject-position. Rather, *John* is a proper noun "which generally [has] unique denotation" within a given universe of discourse (CGEL 5.60, p. 288). A unique entity represents the only possible extension of a type even if the underlying concept involves more than one individual, as in (10d). Unique denotation entails uncountability based on inherent inclusiveness of reference. In this sense, examples a.-f. are taken as cases of reference to a unique entity. On the surface level of the lexical expression this fact is accounted for by the lack of a determiner. The semantic operator UNIQUE, which functionally accounts for reference to a unique entity, has to be located on the level of the term-operators in an either/or relationship to DIFF, as it may be subsumed under either GENERIC or MSPEC (fig. 11):

(11) a. John studies ϕ American literature.

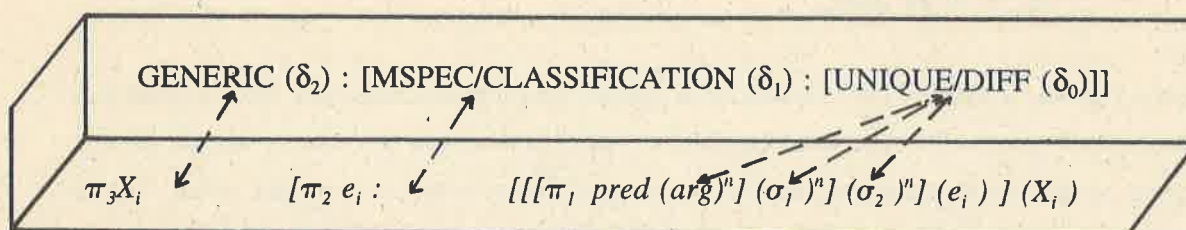
= GENERIC [Pres $\phi_{(x_1)}$:GOAL_(x2) [study_v (UNIQUE1_{x1}:John_N (x₁))
(UNIQUE1_{x2}:literature_N(x₂):American_A(x₂))]]

b. John studies **the** literature of **the** American south.

= GENERIC [Pres $\phi_{(x_1)}$:MSPEC-GOAL_(x2) [study_v (UNIQUE1_{x1}:John_N (x₁))
(UNIQUE1_{x2}:literature_N (x₂)):
{MSPEC-SOURCE_(x3) (UNIQUE1(x₃):
south_N (x₃):American_A (x₃))}]]]

Our model may thus be completed on the basis of the following definition: A term realized as a function of the UNIQUE-operator appears as a proper noun, bare plural (cf. Carlson 1980), including uncountable nouns, or the "name", that is label, of an abstract concept. Since the feature [+inclusiveness of reference] is inherent to the status "proper noun/name" the definite article cannot be used unless an additional MARKED SPECIFICATION has been carried out. Thus, a term appearing under a UNIQUE-operation signals the following to the addressee: This is the referent for which the predication is true. It is entirely irrelevant whether or not in principle a different section of possible referents could also be imagined. With the definition of UNIQUE, the functional model of referential processes is now complete (fig. 12).

(12) Location of the semantic operators involved in referential processes



We arrive at a hierarchically organized system of semantic operations, which is consistent with but not fully integrated in the layered organization of morpho-syntactic elements in the underlying clause structure. The semantic operators replace Dik's term operators genericity/specificity and definiteness/indefiniteness as regards the representation of the semantic and formal features of expressions involved in referential processes. We have shown that genericity and specificity (in the sense of MARKED SPECIFICATION) cannot be

associated with the structure of individual terms. *Definiteness* and *indefiniteness* we have reanalyzed in terms of [uniqueness]/[inclusiveness of reference] and [countability]. The existence of intrinsically definite operators ("prox"/"rem", cf. Dik 1989:147) and, as Dik's examples (1989:149ff.) imply, intrinsically indefinite (quantifying) operators, however, indicates that further analysis is necessary before the exact semantic and/or morpho-syntactic nature of this distinction can be determined.

Regarding article usage, the relationship may be summarized as follows:

| | |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNIQUE | - no article |
| DIFF | - indefinite article |
| MSPEC | - definite article |
| CLASSIFICATION | - no article |
| GENERIC | - no influence on article usage; and <i>vice versa</i> the operators of the lower levels have no influence on the genericity of a predication. A non-generically referring subject-NP (e.g. a proper name) is permissible and does not impose any contradiction. |

The overall implications of adopting a "box-model" of underlying clause structure, however, reach beyond questions of reference and article usage. There is some evidence that a further analysis of the exact properties of e.g. the CLASSIFICATION-operator may lead to the definition of additional operators which account for the selection of a specific semantic function (cf. Klages-Kubitzki 1995:18ff.; 64ff.). Furthermore, new aspects of the layer 1/layer 2-satellite-distinction may become evident once the applicability of the "box-model" has been tested in areas other than referential processes.

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