ADJECTIVE-NOUN SEQUENCES AT THE CROSSROADS BETWEEN MORPHOLOGY AND SYNTAX: AN FDG PERSPECTIVE*

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Abstract

This paper offers a proposal for the treatment of English Adjective-Noun sequences within Functional Discourse Grammar (FDG). Adjective-Noun sequences illustrate the unresolved problem of distinguishing between compounds and phrases. It will be shown that stress, as well as other diagnostic criteria like the acceptance of the pro-*one* construction, fail to draw a clear distinction between a morphological and a syntactic construction. The contention in this paper is that there is not a strict division but a gradual distinction generated at the Conceptual component, where the decision on the function of a linguistic expression is made. More specifically, it will be proposed that the different types of Adjective-Noun sequences can be explained by means of the semantic frames that FDG postulates at the Representational level, in particular by means of the distinction between Property modification and modification of an Individual.

Key words: Adjective-Noun compounds, Adjective-Noun phrases, morphology-syntax interface, FDG, Property modification, Individual modification, Representational level.

Resumen

Este artículo ofrece una propuesta para el tratamiento de las secuencias de Adjetivo-Nombre en inglés dentro de la Gramática Funcional Discursiva (GFD). Las secuencias de Adjetivo-Nombre ilustran el problema irresoluto de la distinción entre compuestos y frases. Se mostrará que el acento, así como otras pruebas diagnósticas como la aceptación de la construcción con *one,* ha fracasado en marcar una distinción clara entre una construcción morfológica y otra sintáctica. La idea defendida en este artículo es que no existe una división tajante sino una distinción gradual generada en el componente Conceptual, donde se decide la función de una expresión lingüística. Más específicamente, se propondrá que los distintos tipos de secuencias de Adjetivo-Nombre se pueden explicar mediante los marcos semánticos que el modelo de GFD postula en el nivel Representacional, en particular mediante la distinción entre modificación de una Propiedad y modificación de un Individuo.

Palabras clave: compuestos de Adjetivo-Nombre, frases de Adjetivo-Nombre, interfaz morfología-sintaxis, GFD, modificación de una Propiedad, modificación de un Individuo, nivel Representacional.

1. INTRODUCTION

This paper addresses an extensively debated problem in morphological research when dealing with the syntax-morphology interface, specifically, the distinction between phrases and compounds, focusing on Adjective-Noun sequences. On one side, we find Adjective-Noun phrases like (1a). On the opposite side are found well established (lexicalized) compounds like (1b).

(1)   a. *black bird*
       b. *blackbird*

Orthographic conventions make the distinction between phrasal and morphological combinations clear in cases like (1b). Apart from orthography, a traditional assumption has been that the decision on the status of a given Adjective-Noun combination mainly relies on stress placement (Bauer, *English Word-Formation* 205): "nuclear stress on the adjective ... indicates a compound; nuclear stress on the noun indicates a noun phrase," as shown in (2):

(2)   a. '*deep structure*
       b. *deep* '*structure*

A problem is posed, however, by the existence of what seems to be a parallel use of stress with a disjunct set of adjectives. Thus, in addition to well established sequences with monosyllabic adjectives like those in (1b) and (2a) the fore-stress (compound-like) pattern is also found with adjectives like those in (3):

(3)   '*secondary school,* '*dramatic society*

Constructions involving this second set of adjectives have not been traditionally viewed as words at all (Bauer, "Adjectives"). Therefore, it appears that there are two Adjective-Noun constructions in English, one of which is a compound (e.g. '*deep structure*), the other of which is a phrase (e.g. *deep* '*structure*). In between, there are Adjective-Noun sequences for which the stress criterion fails to draw a clear distinction between a morphological and a phrasal construction (e.g. '*secondary school*) (Bauer, "Adjectives," Giegerich, "Associative").

The existence of compound-like phrases is a property of many languages (Jackendoff; Booij, *Morphology*). For instance, the Dutch phrases in (4) are used to refer to (categories of) objects (Booij, *Compounding,* 214):

(4)   *dikk-e darm* 'large intestine'
         zwart-e doos 'black box'

In Dutch there is some morphological evidence to regard these combinations as phrases, since the adjectives are inflected. However, the striking property of these phrases is that the adjective does not admit independent modification. For instance, in the phrase *hele zwarte doos* 'very black box' the specific meaning of 'black box' as used for the registration device in air planes gets lost.

In a morphologically impoverished language like English drawing a distinction is even more problematic, since no morphological division can at first sight be drawn between two types of combination, which are therefore structurally ambiguous. For this reason, a number of diagnostic tests have been proposed, in addition to stress, as will be shown in what follows.

2. DIAGNOSTIC CRITERIA

This section will revise some of the most relevant criteria invoked in order to distinguish lexical from phrasal sequences.

2.1. Stress

As stated previously, stress is one of the key properties traditionally used in the distinction between compounds and phrases. However, it has also been shown that it is not a reliable criterion as the distribution of fore-stress and end-stress is far from regular (see, for example, Bauer, "When is a sequence," "Adjectives"; Giegerich, "Compound").

Attempts have been made to find independent criteria coinciding with stress in order to draw conclusions on the lexical vs. phrasal status of a sequence. The role of different factors, like different types of semantic or structural relations between the adjective and the noun, have nevertheless proved to make the wrong predictions (Giegerich, "Compound," "Associative"; Plag, Kunter, Lappe and Braun).

As regards structural factors, end-stress is not expected to be found in complement-head constructions (e.g. *speech* recognition) and fore-stress is not expected with modifier-head constructions (e.g. *hotel kitchen*) in the case of Noun-Noun compounds (Olsen 60). However, in the case of Adjective-Noun sequences, the results are often confusing and the previously mentioned distinction does not seem to be relevant, as these sequences may be fore-stressed (e.g. '*tidal wave,* '*polar bear*) or end-stressed (e.g. *industrial* '*revolution, polar* '*ice*) regardless of whether the adjective is seen as an argument (as in '*tidal wave* and *industrial* '*revolution*) or as a modifier of the noun (as in '*polar bear* and *polar* '*ice*). Giegerich ("Associative" 587) provides further examples of fore-stressed Adjective-Noun sequences with a modifier or a complement-head structure, as can be seen in (5):

(5)   'dental care, 'financial advisor (complement-head)
       'dental appointment, 'mental hospital (modifier-head)

Furthermore, some of these fore-stressed (i.e. compound-like) constructions may behave like phrases in other respects, as the possibility of the pro-*one* construction (see below), as can be seen in (6)

(6)   Do you have a *medical appointment* or a *dental one*?

A different factor alluded to in connection with stress position in Adjective-Noun sequences is the type of the adjective, more specifically, the distinction between relational or associative adjectives and non-relational or ascriptive ones. While the latter denote "a property which is valid for the entity instantiated by the noun" (Ferris 24), as can be seen in *slow decay,* the former express a property which "...does not apply literally to the denotation of the head nominal, but rather to some entity associated with it" (Pullum and Huddleston 556; Ferris 24). For example, in *dental decay* the adjective does not describe the nature of the decay but identifies what is decaying (Giegerich, "Attribution" 2). Olsen (66-67) notes that the adjectives in left-hand stressed Adjective-Noun sequences are all explicitly relational and hence these sequences are similar to Noun-Noun compounds, as the examples in (7a) show. However, not all Adjective-Noun combinations with relational adjectives are fore-stressed, as can be seen in (7b).

(7)   a. 'polar bear (cf. 'mountain lion), 'tidal wave (cf. 'drug death)
       cf. b. national 'security, global 'warming, industrial 'revolution

Giegerich ("Associative" 587-588) specifically focuses on relational adjectives in his in-depth study of associative adjectives in English and he concludes that both end-stress and fore-stress occur among Adjective-Noun sequences with associative adjectives.

Summing up, there are Adjective-Noun sequences with fore-stress (compound-like) and Adjective-Noun sequences with end-stress (phrase-like), regardless of whether the adjective is an argument or a modifier, relational or not. Therefore, stress per se or in conjunction with the previous factors cannot be held as a reliable factor to draw a distinction between two different types of Adjective-Noun sequences.

Other criteria often employed when drawing the lines between phrases and compounds are specific syntactic constraints.

2.2. SYNTAX

The lexicalist hypothesis that elements within the word should not be available to the syntax implies that elements within compounds are not expected to be selected by anaphora and cannot be modified independently.

Firstly, compounds are assumed not to allow replacement of the head noun by *one* in anaphoric relations, since this is regarded as a syntactic operation which might therefore be expected to be impossible within a lexical structure (Bauer, "When Is a Sequence" 76-78).

Yet, for Giegerich ("Associative" 579) there are many Adjective-Noun sequences that license this construction, even though they might be regarded as lexical in other respects. The author provides examples like (8) to show that there is a substantial number of associative adjectives that can readily modify *one* as long as suitable head nouns are chosen:

(8)   Is he a rural policeman or an urban one?

That is, leaving aside lexicalized combinations the possibility of one-construction seems to depend on the adjectives being semantically comparable, as the corpus examples in (9) show (Corpus of Contemporary American English, henceforth COCA):[1]

(9)   the old world or the new one [2012 FIC Analog]
        the political structure and the societal one [2011 ACAD MiddleEastQ]

In addition to the counterevidence provided by these cases, the lack of validity of this test is corroborated by a different fact. This test is also used to distinguish complements (not allowing the construction) from modifiers (allowing it) within the noun phrase, so that one may wonder whether it is really a useful criterion to distinguish phrases from compounds (Payne and Huddleston 440-41). Thus, example (10) is probably wrong because financial is a complement of advisor and is included in the reference of one:

(10)   *Is he a financial advisor or a legal one?   (Giegerich, "Associative" 579)

By contrast, a similar example like (11) (adapted from Payne and Huddleston 441), in which the adjective functions as a modifier, would be acceptable:

(11)   It turned out that he was an honest lawyer, not a criminal one, as I'd been led to expect

Therefore, what this test would appear to prove in any case is not the phrasal or compound status of the combination but the relation of the first component to

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[1] The Corpus of Contemporary American English (COCA), created by Mark Davies of Brigham Young University, is the largest freely-available corpus of English. The corpus contains more than 450 million words of text and is equally divided among spoken, fiction, popular magazines, newspapers, and academic texts. It includes 20 million words each year from 1990-2012 and it is also updated regularly (the most recent texts are from Summer 2012).

the head. However, it does not even seem to work in cases like the previous one, as the counterexample in (12) reveals:

(12)   You may need PARTICULARIZED advice from someone deeply familiar with your situation—either a *financial advisor*, or a *legal one*, but in any event someone who owes you a confidential, fiduciary relationship and has your best interests at heart (<http://misc.mailarchive.ca/legal.moder-ated/2010-03/0616.html>, web 11 Oct 2012).

In short, examples like these raise serious questions regarding the reliability of the *one*-construction to draw a line between compounds and phrases.[2]
        There are other syntactic tests, like coordination with another adjective or premodification of the adjective. However, the usefulness of these tests is also very unclear as they seem to work only in lexicalized examples and, in general, the possibility of coordination with another adjective depends on the existence of a parallel semantic relation between the adjectives that are coordinated rather than on the phrasal (vs. compound) status of a sequence, as the COCA examples in (13) show.

(13)   political and economic crisis [2010 NEWS CSMonitor]
        cf. ?financial and volcanic crisis

        solar and electric heat [1993 NEWS CSMonitor]
        cf. *solar and lunar heat (Sadler and Arnold)

        hot and cold war [1999 ACAD SocialResrch]
        cf. ?long and cold war

Likewise, pre-modification of the adjective by degree words or other adjectives is generally not possible in lexicalized examples or with non-gradable adjectives. However, it is not so rare in not so well-established sequences, as can be seen in the COCA examples (14) and (15):

(14)   very professional testing [1996 NEWS SanFranChron]
        very unscientific testing [2002 SPOK NBC_Today]

(15)   [central European] crisis [1993 SPOK NPR_ATC]
        [lower abdominal] surgery [2007 ACAD Anesthesiology]
        [entire electronic] testing [1993 MAG Compute]
        [national standardized] testing [2008 ACAD Writer]

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[2] This test was already discredited by Ward, Sproat and McKoon.

What these examples show is that, with the exception of lexicalized examples, independent premodification of the adjective in an Adjective-Noun sequence seems to depend on the adjective itself rather than on the morphological or phrasal nature of the sequence.

In addition to syntactic criteria, the distinction between phrases and compounds is sometimes based on semantic aspects, some of which have been mentioned in connection with stress.

2.3. Semantic predictability and structural-semantic relations

Features like semantic predictability have been used in an attempt to draw the distinction between the phrasal and lexical types. However, this factor is not reliable either. Thus, though many compounds are opaque, there are also numerous established compounds that are semantically transparent, like *raindrop* or *backache*.

Semantic predictability might be related to the expression of an argument relation by the adjective (Giegerich, "Compound" 577-579). This type of relation is typically found when the noun is deverbal. For example, *cardiac massage, dental treatment* and *electrical supply* have an argument-predicate structure and are therefore predictable and hence syntax-like in terms of meaning. By contrast, the need for encyclopaedic and extralinguistic knowledge to interpret cases in which the adjective is not analysed as an argument of the noun, which are typically non-deverbal cases like *electrical clock, musical comedy, dental floss, medical school,* makes Giegerich suggest that such constructions originate in the lexicon.

However, Giegerich ("Compound") contradicts his own conclusion about examples showing an argument-predicate relation when he uses a different test, the possibility of *one*-construction. Thus, he says that "because *cardiac massage* has an argument-predicate structure which *tropical fish* lacks, the former does not license the *one*-construction, that is, it is lexical, while the latter may not be" (580).

Summing up, in the light of the evidence against all the different criteria, it should be clear by now that the usual diagnostic tests fail to draw a distinction between a morphological and a syntactic construction and that factors different from the aforementioned phonological, syntactic or semantic ones should be paid attention to if any distinction was to be drawn between different types of Adjective-Noun sequences.

3. FUNCTIONAL AND COGNITIVE FACTORS IN THE USE OF ADJECTIVE-NOUN SEQUENCES

In this section it will be suggested that the reason why the usual distinguishing criteria fail to draw a line between compound and phrasal Adjective-Noun sequences is that there is not a strict division but a gradation of types. This is generated at the prelinguistic Conceptual Component, where the decision on the specific function of a linguistic expression is made. Additionally, a number of cognitive

factors will determine the tendency of an Adjective-Noun combination to be more compound-like or more phrase-like.

3.1. Functional factors

Bauer (*Introducing,* "Adjectives") resorts to a functional distinction when he tries to explain the difference between two types of Adjective-Noun sequences. More specifically, he notes that phrases have a descriptive function while compounds have a naming function, that is, while phrases describe entities, compounds characterize something as a special category (see also Booij, "Phrasal"; Hüning):

> Like derivatives, compounds provide names for entities, properties or actions. This is opposed to providing descriptions, which is the function of syntax. (Bauer, Introducing 135)

The naming function involves the creation of a link between an expression and a concept (Booij, Construction 169, drawing on Koefoed). This functional distinction is therefore crucial to understand the different status of Adjective-Noun sequences, since Adjective-Noun sequences used as names are often conventional expressions, and hence lexical units available in the mental lexicon, whereas descriptive Adjective-Noun sequences are not stored but they are computed online.

The naming function of an Adjective-Noun sequence might be related to attributive position. Thus, Bolinger (7) makes two fundamental observations regarding adjectives in pre-nominal position. First, he observes that adjectives in pre-nominal position share a set meaning that he calls 'characterization'. Specifically, an attributive adjective enables to select the referent of the noun, to name a class of entities. This explains the semantic difference between *loose coat* ('loose-fitting') and *Your coat is loose* ('unfastened'). By contrast, an adjective denoting a property that is too fleeting to characterize anything is restricted to predicative position, as can be seen in *The man is ready* vs. **the ready man.*

On the other hand, Bolinger (23) draws a distinction between Referent modification and Reference modification, illustrated by *drowsy policeman* and *friendly policeman,* respectively. While a *drowsy policeman* does not refer to someone who is drowsy "qua policeman," that is, his being drowsy is not related to his being a policeman, a *friendly policeman* refers to friendliness in the way policemen behave.

Bolinger's distinction is partially reminiscent of that between ascriptive adjectives and associative adjectives, mentioned in Section 2.1, and of that between 'inherent' and 'non-inherent' adjectives, respectively (Quirk, Greenbaum, Leech, and Svartvik 435): while the former apply to the referent of the noun directly (e.g. *the old man, slow decay*), the latter denote a quality applying to the aspect of the referent identified by the head noun (e.g. *my old friend, dental decay*).

It is therefore not surprising that the naming function of an Adjective-Noun sequence (i.e. its compound-like status) appears to be connected with the type of modification by the adjective and, accordingly, with specific types of adjectives.

Reference modification is associated with a naming function (and hence associative and other attributive adjectives), while Referent modification is related to a descriptive function (and hence ascriptive adjectives). This correlation is confirmed by different degrees of syntactic freedom: ascriptive adjectives license attributive and predicative use without a change of meaning, while associative and other non-inherent adjectives are typically used exclusively in attributive position.

However, the correlation Naming function ≈ Reference modification ≈ Associative/ Non-inherent adjective and Descriptive function ≈ Referent modification ≈ Ascriptive/ Inherent adjective is not absolute. On the one hand, though it seems that all associative adjectives become modifiers of the reference of the noun when used in attributive position (Bolinger 18) some can be used in both positions. For example, *bovine* is an associative adjective in *bovine tuberculosis,* which denotes a type of tuberculosis, but in *John's behaviour was rather bovine,* it describes John's behaviour and therefore it is ascriptive. Conversely, we can find adjectives which are typically descriptive but are used as modifiers of the reference system of the noun in cases such as *beautiful dancer, slow learner* or *heavy smoker.* Likewise, temporary adjectives, which are normally restricted to predicative position can be used attributively if nouns are distinguished by them, that is, when they have a naming function. Thus, compare *loose* in *Your coat is loose* (i.e. 'unfastened') and a *loose coat* (i.e. 'a loose-fitting coat').

We may thus postulate the existence of an Adjective-Noun sequence continuum with two prototypical constructions at the two extreme ends, one of which is compound-like with a naming function, the other of which a phrase-like with a descriptive function. This is shown in Table 1. Typically, though not exclusively, adjectives in constructions of the first type are associative or non-inherent adjectives, function as Reference modifiers and are restricted to attributive position, while adjectives appearing in descriptive Adjective-Noun phrases are most frequently ascriptive adjectives which modify the referent of the noun and can appear in both attributive and predicative position. In between are found a great number of less prototypical cases, as the previous examples show.

TABLE 1. THE ADJECTIVE-NOUN SEQUENCE CONTINUUM	
PROTOTYPE 1	PROTOTYPE 2
Naming	Description
Reference modifiers	Referent modifiers
Associative & non-inherent adjectives	Ascriptive & inherent adjectives
Attributive position	Attributive and predicative position
Compound-like	Phrase-like

Acknowledging the existence of this continuum would run against traditional assumptions, by which compound-like sequences have been associated with either lexicalized examples of the *blackbird* type or with Adjective-Noun sequences where the adjective was associative or relational and filled an argument slot (e.g.

dental decay). The latter have thus been compared to Noun-Noun compounds due to the fact that associative adjectives are considered to be "nouny." Instead, it should be emphasized that though Adjective-Noun sequences with associative adjectives are more likely to be compound-like, it is not the adjective but its use in a specific construction or schema with a naming function that will determine the compound-like status of an Adjective-Noun combination. The morphological vs phrasal nature of an Adjective-Noun sequence therefore hinges on the specific function with which the sequence has been created, Naming or Description, not on the type of adjective.

The previous considerations on the lack of one-to-one mapping between associative adjectives and compound-like sequences would appear to suggest that the attributive use of any (associative or ascriptive) adjective makes a construction compound-like, with the subsequent implication that all attributive Adjective-Noun sequences are morphological constructs. Therefore, the search of other factors on which to base the distinction between morphological and phrasal Adjective-Noun sequences is called for. In particular, the proposal in this paper is that the compound-like status of an Adjective-Noun sequence has a cognitive basis and therefore a number of factors like frequency as well as the semantic tightness of the sequence should be regarded as crucial for the distinction.

3.2. Cognitive factors

In this section it will be suggested that the wordhood of an Adjective-Noun sequence, that is, its compound status, is associated to a number of cognitive factors, like its frequency or the degree of semantic bonding between the adjective and the noun.

The view of frequency as the determining factor for the entrenchment of a sequence in the mental lexicon and its subsequent holistic storage is a widely held assumption. Different scholars have argued that high frequency allows forms to become entrenched and acquire an existence of their own independently of the items they consist of (Bybee and Hopper). Sequences of words that are frequently used can be represented mentally, that is, stored in memory, even though they are formed by regular rules. As Tremblay and Baayen (152) put it, "words used together wire together."

An additional relevant factor in the entrenchment of Adjective-Noun sequences in the mental lexicon, that is, its compound status, is the cognitive relevance of the combination, that is, the relevance of the property denoted by the adjective in the concept denoted by the noun. Properties that are likely to be included in the reference system of a noun will display a tendency to appear in combination with those nouns. Again, the realization of this fact is not new, but can be traced back to Bauer ("Adjectives"), who notes that stress placement on the first element (that is, a compound-like feature) might depend on the *saliency* of the modifier with a noun, even in cases where an Adjective-Noun sequence is not regarded as a compound.

The saliency of an adjective for a noun could be measured in terms of the degree of semantic bondedness between the adjective and the noun, which

is provided by some corpora in the Mutual Information (MI) score. A MI score relates one word to another. For example, if *dental* is often found with *caries*, they may have a high MI score. Investigating these facts is nevertheless far beyond the scope of this paper.

4. THE TREATMENT OF ADJECTIVE-NOUN SEQUENCES IN FUNCTIONAL DISCOURSE GRAMMAR

The sharp distinction between the syntactic and morphological components of many grammatical theories fails to account for the in-between status of a large number of Adjective-Noun sequences and for the functional similarities between these sequences and Adjective-Noun compounds. However, Functional Discourse Grammar (henceforth FDG) (Hengeveld and Mackenzie, *Functional,* "Functional") is in principle well suited to provide such an account since it does not make a distinction between a syntactic and a morphological level of analysis, on the belief that the principles used in the formation of words are the same as those used in the formation of phrases and clauses.

The FDG model is a structural-functional theory of language that is designed as the Grammatical Component of a wider theory of verbal interaction. Its defining characteristics can be summarized as follows: (i) FDG has a top-down organization; (ii) FDG takes the Discourse Act rather than the sentence as its basic unit of analysis; (iii) FDG contains an Interpersonal Level, which captures all distinctions related to the interaction between Speaker and Addressee, a Representational Level, which deals with the semantic aspects of a linguistic unit, a Morphosyntactic Level, which is concerned with the structural aspects of a linguistic unit, and a Phonological Level, which contains both the segmental and the suprasegmental phonological representation of an Utterance; (iv) FDG is connected to Conceptual, Contextual, and Output Components.

Within the top-down organization of the grammar, pragmatics governs semantics, pragmatics and semantics govern morphosyntax, and pragmatics, semantics and morphosyntax govern phonology. Thus, in the prelinguistic Conceptual Component a communicative intention and the corresponding mental representations are relevant. The operation of Formulation translates these conceptual representations into pragmatic and semantic representations at the Interpersonal and the Representational Levels respectively. The configurations at the Interpersonal and the Representational Levels are translated into a morphosyntactic structure at the Morphosyntactic Level through the operation of Morphosyntactic Encoding. The structures at the Interpersonal, Representational and Morphosyntactic Levels are translated into a phonological structure at the Phonological Level.

FDG is not assumed to be 'constructional' in the Goldbergian sense, that is, it does not acknowledge the existence of pairings of form and meaning, though it also makes use of some sort of schemas, 'predication frames', at the Representational Level that are eventually linked to different morphosyntactic representations at the Morphosyntactic Level.

FDG's Representational Level interacts in different ways with the Morpho-syntactic Level in the different types of Adjective-Noun sequences.

In the case of phrasal combinations like *interesting 'book* there would be two lexical elements in the underlying semantic representation at the Representational Level, of the Lexeme classes adjective and noun. The output after processing by the morphosyntactic encoder will be a noun phrase (Np), as shown in (16):

(16) $(Np_i: [(Aw_i: interesting_A (Aw_i)) (Nw_i: book (Nw_i))] (Np_i))$

In well-established cases of combinations like *black box* FDG also proposes two lexical elements in the underlying semantic representation, although the output after processing by the morphosyntactic encoder will be of the word class noun (Nw), as can be seen in (17). As a matter of fact, FDG makes a distinction between Lexeme classes (at the Representational Level) and Word Classes (at the Morpho-syntactic Level) to account for the lack of one-to-one relation between Lexeme class and Word Class in Compounds:

(17) $(Nw_i: [(As_i: black (As_i)) (Ns_i: box (Ns_i))] (Nw_i))$

However, it seems reasonable to suggest that in cases like *black box* there should not be two lexical elements at the Representational Level, as these cases are non-compositional and they are taken directly (ready-made) from the Lexicon as compound lexemes. In any case, the word status of *black box* brings with it a number of consequences. For example, *black box* will not license a number of syntactic operations like premodification of the adjective by a degree word or other adjective. Thus, compare the phrase *interesting book* with the compound *black box* in (18), which can only be premodified as a whole and does not allow degree words:

(18)   *very* interesting book
         $(x_i: [(f_i: book (f_i)) (x_i)]: [(f_j: interesting (f_j) [(f_k: very (f_k)) (f_j)]) (x_i)])$

         *very black box
         little black box
         $(x_i: [(f_i: box (f_i)) (x_i): [(f_j: black (f_j) (x_i)]) [(f_k: little (f_k)]) (x_i)])$

We now consider "in-between" cases, that is, sequences with mostly asso-ciative adjectives which are not lexicalized, like *dental clinic.* The problem posed by these cases is that they behave like phrases in some respects and as words in others. That is, it is likely that the morphosyntactic encoder is confused by the semantic representation of many of these sequences, so that two Lexemes at the Represen-tational Level may correspond to one Word (i.e. a compound) or two Words (i.e. a phrase) at the Morphosyntactic Level, with the corresponding repercussions (i.e. different syntactic options or constraints).

However, FDG offers a possible way out of this problem. In the previous lines it has been shown that these unclear cases of combination are mainly formed

by Reference modifying adjectives. The distinction between two different types of modification and correspondingly two different types of Adjective-Noun sequences is accounted for within FDG. At the Representational Level FDG draws a distinction between Property modification and modification of an Individual, which corresponds to Bolinger's Reference-modification and Referent-modification, respectively (see Section 3.1). Thus, Hengeveld and Mackenzie (*Functional* 230) present *rich neighbour* as an example of modification in which an Individual (x) is characterized as having the Properties 'neighbour' and 'rich'. By contrast, in *former neighbour* it is the Property (f) 'neighbour' that is restricted in its application by the Property 'former', and these together constitute a Property of an Individual.

This difference may be represented as in (19) and (20), respectively:

(19) $(x_i: [(f_i: \text{neighbour} (f_i)) (x_i)]: [(f_j: \text{rich} (f_j)) (x_i)_\phi])$
(20) $(x_i: [(f_i: \text{neighbour} (f_i): [(f_j: \text{former} (f_j)) (f_i)_\phi]) (x_i)_\phi])$

These representations show that the adjective *former* modifies a Property, while the adjective *rich* modifies an Individual. They also show that *former neighbour* constitutes a Configurational Property, which explains why it may be referred to anaphorically as a single unit, as seen in (21):

(21) a rich *former neighbour* and a poor *one*

The distinction illustrated with the previous examples might be seen as correlating with a distinction between sequences of a hybrid nature and sequences regarded as phrasal. The former can be referred to anaphorically as wholes, while the latter are not so easily amenable to anaphoric reference as single units, as the examples in (22) show:

(22) a. a large *dental clinic* and a small *one*
      b. an old *interesting book* and a recent *one* (interesting?)

Though *one* might possibly refer to the whole sequence 'interesting book' in (22b), this interpretation is optional while the reference of *one* can only be 'dental clinic' in (22a).

The fact that Property modifiers constitute Configurational Properties is also revealed in the relative order of adjectives, as Property modifiers appear closer to the noun, with modifiers of an Individual occupying a more peripheral position in a sequence, as shown in (23):

(23) *large dental clinic vs *dental large clinic*
      *exhaustive dental check-up vs *dental exhaustive check-up*

The formal representations proposed to account for the difference between *rich neighbour* and *former neighbour* could be conveniently used to explain ambiguous cases like *criminal lawyer,* in which the Property 'criminal' may modify an

Individual (x) ('a lawyer who is a criminal') or a Property ('a lawyer who works in relation with crimes'). This is shown in (24):

(24) $(x_i: [(f_i: \text{lawyer } (f_i)) (x_i)]: [(f_j: \text{criminal } (f_j)) (x_i)])$ 'a lawyer who is a criminal'
      $(x_i: [(f_i: \text{lawyer } (f_i): [(f_j: \text{criminal } (f_j)) (f_i)]) (x_i)])$ 'a lawyer who works in relation with crimes'

The different types of sequences can thus be explained by means of the semantic frames that FDG postulates at the Representational Level. Depending on the specific function intended by the Speaker (Naming or Describing) at the prelinguistic Conceptual component these frames would be filled up with different types of lexical material: the insertion of lexical Properties modifying an Individual (typically by means of ascriptive adjectives) will result in sequences with a Descriptive function. Conversely, the insertion of lexical Properties not modifying the referent of the noun directly but another Property (typically by means of associative adjectives) will result in Configurational Properties with a Naming function. This is shown (rather informally) in (25):

(25) $(x_i: [(f_i: \text{Noun } (f_i)) (x_i)]: [(f_j: \text{Adjective } (f_j)_{\text{Ascriptive}}) (x_i)])$ Description
      $(x_i: [(f_i: \text{Noun } (f_i): [(f_j: \text{Adjective } (f_j)_{\text{Associative}}) (f_i)]) (x_i)])$ Name

This means that no decision needs to be made beforehand on the wordhood of an Adjective-Noun sequence, but on its function.

In the latter case (i.e. with naming sequences), the selection of specific (mainly associative) adjectives for a noun will be made on the basis of information on characteristic properties associated with the concept denoted. For example, the concept for *floss* includes features like 'soft thread' and 'used to clean between the teeth', which will make *dental* a very likely candidate to fill the adjective slot in the frame. This would imply the requirement of a link between lexical items and the Conceptual component, as recently proposed by Butler.

At the Morphosyntactic Level different operations will be allowed depending on these different functions: Descriptive sequences will show the syntactic freedom of phrases, while Naming sequences will in general be more restricted. For example, when a Property is assigned to an Individual as in *the old man,* this modifier can also appear as the predicate in a full clause (e.g. *The man is old*). This possibility is generally not available to modifiers of a Property. For example, there would be no **The student is medical* corresponding to *the medical student (*Hengeveld and Mackenzie, *Functional* 242). In Spanish, where the default position of the adjective is post-nominal, pre-nominal position indicates a naming function in cases like *un gran hombre* 'a great man' vs. *un hombre grande* 'a big man' (Booij, "Phrasal" 226, citing Dahl 229).

On the other hand, premodification of the adjective is not allowed in many cases. However, this restriction follows from the non-gradable nature of the adjective rather than from being a Property modifier, as can be seen in (26), where *heavy* is premodified by *very* in spite of being a Property modifier:

(26)   I thought he probably had lung cancer. He was a *very heavy smoker* [2001 SPOK CNN_king]

The formal repercussions of the type of modification within Adjective-Noun sequences are more significant in morphologically richer languages like Dutch, German or Greek. For example, Dutch obligatorily shows agreement in the case of modification of an Individual (27a), but not necessarily in the case of Property modification (27b) (Hengeveld and Mackenzie, *Functional* 231):

(27)   a. Jan is een *rijk-e* timmerman   Modification of an Individual
            'John is a rich carpenter'
        b. Jan is *voormalig* timmerman   Property modification
            'John is former carpenter'

Naming sequences may nevertheless show different degree of syntactic potential depending on a number of conceptual and contextual factors. There is therefore an interplay between the Grammatical Component and both the Conceptual and the Contextual components. For example, a relevant conceptual factor is the saliency of the adjective in the conceptual schema of the noun, which might correlate with the frequency of the sequence, its lexicalization and its subsequent storage within the mental Lexicon, bringing with it syntactic restrictions, although this is a gradual process.

The Grammatical Component interacts with the Contextual Component in different ways. Thus, in order to licence the attributive use of an adjective inserted in a frame specified as Descriptive at the Representational Level, the Morphosyntactic level might have to look into the Contextual component. Prior establishment in discourse may license the attributive use of adjectives with a Referent-modification function, as seen in example (28):

(28)   I got my hands full of splinters from those *sharp sticks* (Bolinger 24)

This example, where *sharp sticks* does not denote a specific type of sticks (i.e. it does not have a naming function) but sticks that happen to be sharp is licensed by the previous mention of (29)

(29)   Look out, those sticks are sharp

The specific co-text in which a sequence is used must also be resorted to in order to check semantic similarity with other contrasting adjectives, and can therefore also be a relevant factor to determine syntactic options like coordination with other adjectives or replacement of the head noun with *one*, as shown in examples (30a) and (30b):

(30)   a. Do you need a *Thai massage* or a *Swedish one*?
        b. cf. ?Do you need a *back massage* or a *cardiac one*?

In some languages the choice of the specific morphosyntactic form for a naming sequence is lexically-driven. For example, in German Adjective-Noun phrases (where the adjective is inflected) and Adjective-Noun compounds are competing productive ways of creating new names. The choice of the corresponding option is controlled by analogy with existing compounds and phrases in the mental Lexicon (Hüning; Schlücker and Plag). For example, German has both compounds and phrases with the adjective *freie*. The choice of the inflected or compound form for new creations is determined by the specific meaning with which this adjective is found in other compounds and phrases stored within the Lexicon. Thus, the meaning 'free of charge' is found in compounds like those in (31a) and will trigger the selection of this form for new creations. Conversely, the meaning 'free to use, modify, distribute' is found in phrases like those in (31b), which will serve as a basis for similar new sequences (Hüning 203):

(31)   a. *Freibier* ('free beer'), *Freigepäck* ('free luggage') and *Freikarte* ('free ticket')
          'free of charge'
      b. *Frei-e Rede* ('free speech'), *frei-e Software* ('free sofware'), *frei-es Format* (free format'), *frei-e Lizenz* ('free license')
          'free to use, modify, distribute'

In these cases, the choice of the specific morphosyntactic form is lexically mediated, that is, conditioned by lexical information (the specific form of *freie*). In particular, a syntactic restriction like the lack of inflection of the adjective, typically associated with the naming function, would be bypassed by checking the occurrence of the adjective (or the noun) in a similar—inflected—construction in the mental Lexicon.

5. CONCLUDING REMARKS

In this paper it has been claimed that the FDG approach can account for a gradation in Adjective-Noun sequences by abandoning a modular approach to the grammar and by treating syntactic and morphosyntactic processes alike. It has been proposed that FDG can handle both Descriptive and Naming sequences homogeneously within the Grammatical component by using the distinction between Property modification and modification of an Individual at the Representational Level. On this approach Adjective-Noun sequences with a Naming function are not stored in the Lexicon, unless they have idiosyncratic properties. In this way, the same Representational Level gives coverage to the formation of functionally distinguished (that is, Descriptive and Naming) sequences while only lexicalized cases are stored.

Needless to say, this view implies advocating the existence of strict dividing lines between the Lexicon and the Grammatical component within FDG, which appears to be a theoretical flaw for some specific cases like that of 'lexical phrases' (Hoekstra) in languages like German. The existence of lexical phrases suggests the convenience of incorporating predication frames as primitives within the Fund,

resulting in a continuum, with lexemes at one end, predication frames at the opposite end and schemata for partially prefabricated constructions in between, as proposed by Butler (632) (drawing on Hengeveld and Smit 1120). The view taken in this paper is nevertheless less radical in the sense that the formation of both phrase-like and compound-like Adjective-Noun sequences is accounted for within the Grammatical Component.

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