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ORDERING RESTRICTIONS OF MODIFIERS IN COMPLEX NOMINALS

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Contents

Abstract

Studies within the cartographic approach seek to contribute to the mapping of universal hierarchies of functional projections. The present work is an investigation of ordering restrictions between the modifiers within complex nominals (Levi, 1978) that express thematic roles, and which do not form a compound with the head noun. I show here that there is indeed a rigid hierarchy of semantic relations within complex nominals suggesting an extension of the functional projections proposed by Scott (2002) for adjectival modifiers (such as ColourP, LengthP, MaterialP etc.). The resulting hierarchy strongly resembles that found within the clausal syntactic domain of circumstantials argued for by Schweikert (2005) and Takamine (2010) in German and Japanese, respectively. As a consequence, my analysis provides support for the syntactic origin of many complex nominals that have often been referred to as (lexical) compounds.

Estratto per riassunto

Studi effettuati nell'ambito del "quadro cartografico" cercano di contribuire alla mappatura delle gerarchie universali di proiezioni funzionali. Il lavoro attuale si presenta come indagine sulle restrizioni d'ordine tra i modificatori di "nominali complessi" (*complex nominals* – Levi, 1978) che esprimono ruoli tematici e che non formano un composto con la testa (N°). Qui dimostro che esiste una gerarchia rigida di relazioni semantiche all'interno dei nominali complessi suggerendo un'estensione delle proiezioni funzionali proposte da Scott (2002) per i modificatori aggettivali (quali ColourP, LengthP, MaterialP, etc.). Dal lavoro risulta una gerarchia che assomiglia chiaramente a quella trovata all'interno del dominio sintattico di circonstanziali (*circumstantials*) sostenuta da Schweikert (2005) per la lingua tedesca e da Takamine (2010) per la lingua giapponese. Di conseguenza l'analisi svolta qui offre sostegno all'origine sintattica di molti nominali complessi che nella letteratura sono stati categorizzati come composti (lessicali).

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List of abbreviations

Authors

B&P	Bosque & Picallo (1996)
L&S	Liberman & Sproat (1992)
P&H	Payne & Huddleston (2002)

Grammatical roles/Semantic relations

ACC.	Accusative
INST.	Instrumental
LOC.	Locative
MAT.	Material
MEAS.-Dur.	Measure-Duration
MEAS.-Num.	Measure- Numerical
NOM.	Nominative
TEMP.	Temporal
TOP.	Topic

Grammatical categories

C-adj.	Classificatory adjective
FP	Functional projection
RelAN	Relative adjective + noun construction
relP	Relative adjective
RelAP	Relative adjective projection
Th-adj.	Thematic adjective
WP	Intermediate XP (into which elements raise in remnant movement)
X_3- X_2-X_1-N°	Where X is any category, X_1 is closest to the N°.

Principles/Concepts

LIH	Lexical Integrity Hypothesis (Chomsky, 1970; Jackendoff, 1972)
RDPs	Recoverably Deleted Predicates (Levi, 1978)

Introduction

Exactly how and where morphology plays a part in our language system has often been a contentious issue within Generative Grammar. Its formal emergence as an independent component of the language faculty came about in Chomsky (1970) through observations on the productivity of gerundive nominals and on the more idiosyncratic behaviour, both syntactic and morpho-semantic, of derived nominals. As a result Chomsky (1970), followed by Jackendoff (1972) and Halle (1973), paved the way for what would become known as the Lexical Integrity Hypothesis which, although surfacing in many different forms over the years[1], has at its base the assumption that syntactic processes are unable to apply word-internally. While many linguists have since defended the idea that morphology is independent from syntax (see in particular Aronoff (1976; 1994), Booij (1977), Scalise (1984), Lieber (1980; 1983), Selkirk (1982), Anderson (1982; 1992), Bauer (1983)), several paradigms have emerged which claim that many of the mechanisms employed in syntax are more than sufficient to derive word forms, thus eliminating the need for a morphological component (see Baker (1988), Halle & Marantz (1993; 1994), Pesetsky (1995), Marantz (2001), Borer (2004), among others).

Theories which employ the same generative system in order to derive all complex objects must therefore necessarily be able to account for the idiosyncrasies of many word forms such as the data discussed by Chomsky (1970) in his analysis of nominalizations. On the other side of the fence, the potential existence of a morphological component requires for the functional interface between the two modules to be formalised given the productivity of both word and sentence formation and the numerous morphosyntactic processes.

A particularly relevant issue in attempting to define any boundary between the two modules is the process of concatenating independent lexemes to form complex word forms: Compounding. It is in fact this very definition, of it being a process of forming words, not

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[1] See among others Lapointe's (1980) 'Generalized Lexicalist Hypothesis', Selkirk (1982) for the 'Word Structure Autonomy Condition' and Disciullo & Williams (1987) for their 'Atomicity Thesis'.

sentences (as is the role of syntax), that has seen it traditionally being treated as a morphological process (see in particular Roeper & Siegel (1978), Lieber (1983), Selkirk (1982), Disciullo & Williams (1987), among others). Other analyses, however, have attempted to reduce compounding to syntactic principles such as Sproat (1985), Lieber (1993) and Baker (1998), among others.

My stance here assumes the traditional viewpoint that at least some word formation takes place in the lexicon, although this is neither relevant nor inherent to my research; my focus will be on developing our understanding of the 'fuzzy boundary' (Bauer, 1998a: 403) between syntax and morphology and on finding evidence for the syntactic origins of many nominal constructions which have traditionally been given the label 'compound'. In other words, this dissertation will investigate nominal and adjectival modifiers of nominal constructions in English[2] which do not form a compound with the head noun (N°). Working within the Cinquean tradition of hierarchical functional projections, I aim to establish a hierarchy of the modifiers in question. The literature on this approach, specifically Scott (2002: 114), shows that the hierarchy of functional projections (FPs) within the DP from highest to lowest terminates with the FP whose specifier hosts '*Material* APs', preceding only 'Compound element'. The scope of my dissertation, in this context, is an extension of the hierarchy of functional projections established for adjectival modifiers in Scott (2002) to the domain of compounds.

In order to carry this out, it will first be necessary to accurately distinguish phrasal modification from compound constructions, a task which is notoriously problematic and which has received much attention in the literature. This will be the scope of chapter 1. My aim here is not to define the 'fuzzy boundary' between a phrase and a compound, but to correlate the most 'phrase-like' qualities of a nominal construction in the hope of identifying the most 'syntactic-like' structures. In chapter 1 I focus specifically on distinguishing syntactic nominal modifiers from the pre-head constituent in a compound,

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[2] My focus is on a treatment of English data, but where specifically mentioned, some cross-linguistic data from Italian (Ch.2: §2.4) and Spanish (Ch.3: §3) will also be provided.

while chapter 2 will introduce a group of adjectival modifiers which display similar behavioural patterns to nouns regarding the compound criteria in particular, namely, relational adjectives. Consequently, this set of adjectival modifiers must also be taken into consideration in any investigation of the compound/phrase dichotomy. We will furthermore adopt the term 'complex nominal' (Levi, 1978) as the label for constructions composed of a head noun (N°) which takes either a noun or a relational adjective as its pre-head constituent based on these above-mentioned parallels.

We will turn in chapter 3 to classifications of the semantic relations that exist between the elements of complex nominals proposed in the literature so as to isolate which of these relations appear to be predicted by syntax. In chapter 4 I will present the theoretical paradigm within which my research takes its shape, namely, the functional-specifier approach advocated by works within the cartographic framework (see among others Cinque (1999; 2006; 2010), Cinque & Rizzi (2008)).

The survey of syntactic-like semantic relations carried out in chapter 3 will serve as the basis for the analysis in chapter 5 where I confirm their syntactic status by showing that there is a rigid ordering between the modifiers which express these relations in question. In chapter 6, we will discuss the implications of the hierarchy established in chapter 5 for the literature presented in earlier chapters and for a potential cross-linguistic examination and address some of the limitations that surface.

For works which examine compounds in other languages see, among others, Ralli & Stavrou (1997) for Greek, Borer (1988) for Hebrew, Spencer (1991) for Turkish and Bisetto & Scalise (1999) for Italian.

Chapter One: *Compound or phrase – diagnostic criteria*

1. Introduction: compounds

The term 'compound' in its most general sense refers to a lexeme formed by the concatenation of two or more independent lexemes[1]. In the literature, nominal compounds which take an adjective or another noun as their first element have been classified according to[2]:

- The type of grammatical relationship that holds between elements, similar to those found in syntactic domains[3]:

(i) **Subordinate** – a complement-head relationship whereby the head subordinates the modifier, often paraphrased by the generic 'of':

taxi driver, *lemon peel*, *baby care*

(ii) **Attributive** – a modifier-head relation whereby the modifier expresses an attribute of the head[4], paraphrased by 'is':

ape man, *blacklist*, *key word*

(iii) **Coordinate** – the elements are coordinated by the conjunction 'and':

singer songwriter, *host-mediator*, *merchant tailor*

- 'Headedness'

(iv) **Endocentric** – a head is present   *road sign*, *toothbrush*, *saucepan*

(v) **Exocentric** – there is no head constituent   *kill joy*, *sabretooth*, *skinhead*

- Whether argument structure is present or not[5]

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[1] In this dissertation I will not delve into whether compounding is autonomous or whether it is a standard morphological process, assuming that true compounding is simply not syntactic. For a recent and thorough overview of compounding in general, see Lieber and Stekauer (2009).

[2] This is by no means a limited overview of compound classifications; see for example the classification of Sanskrit compounds that refers to terminology such as *bahuvrihi* and *dvanda*. My aim is not to provide an in-depth discussion of compound types, it is therefore hoped that the classification outlined here will suffice as an introductory base.

[3] See Bisetto & Scalise (2005: 327)

[4] Which is often metaphorical, see Bisetto & Scalise (2005: 328)

[5] The terminology root/synthetic is often used for English, but is not necessarily relevant for other languages – see Bisetto & Scalise (2005: 320), although see also Bauer (2001: 701-702).

(vi) **Synthetic** – a N° overtly derived from a verb, which takes an internal argument as its pre-head element, typically showing verbal suffixes such as *–er* or *-ing*[6]:

taxi driver, *carwash*, *peace-keeping*

(vii) **Root** – any construction whereby the N° is not deverbal or the pre-head element does not function as the argument of a deverbal N°:

taxi man, *road sign*, *sunglasses*

Although the literature has provided numerous classifications over the years (see in particular Marchand (1969) and Spencer (1991)[7]), a recent version exemplified for English is given below (Bisetto and Scalise (2005: 329)):

(1)

COMPOUNDS					
subordinate		**attributive**		**coordinate**	
endocentric	**exocentric**	**endocentric**	**exocentric**	**endocentric**	**exocentric**
apple cake *brain death* *finger print* *mail man* *sun glasses* *water pipe* *taxi driver* *stone cutter* *arm control* *baby care*	*kill joy* *cut throat*	*blue cheese* *atomic bomb* *back yard* *French kiss* *ape man* *ghost writer* *key word* *public opinion* *sword fish*	*white collar* *green house* *pale face* *long legs* *free lance*	*actor author* *priest hermit* *singer bassist* *dancer singer* *artist designer* *fighter bomber* *king emperor* *merchant tailor*	*mind brain* *mother child* *north east*

As the table shows, all three principal compound categories include examples of exocentric and endocentric compounds, while synthetic compounds are specifically considered

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[6] A definition of a synthetic compound is difficultly obtained and is easier to exemplify (Bauer (2001: 701)). In general, the pre-head element will be an argument of the underlying verb, as exemplified above in (vi). However, Bauer points out that only constructions overtly derived from a verb are considered synthetic so that *speech synthesiser* would be, while *speech synthesis* would not (Lieber (1994: 3608) in Bauer (2001: 701)).
[7] See also Bisetto & Scalise (2005: 22-24) for a good overview.

subordinate endocentric constructions due to their having a deverbal head, which subordinates its theme. Root compounds are taken to either be endocentric subordinate constructions, although lacking in argument structure, or as belonging to the endocentric attributive category. It is additionally worth noting, as a premise for the discussion below, that while subordinate and co-ordinate compounds in this table include only noun + noun examples, the attributive category displays both noun-noun and adjective-noun compounds.

An adjective + noun structure may either be a phrasal construction (*that beautiful green house*) or a lexical compound (cf. *that beautiful greenhouse*), but what about noun + noun constructions? A traditional view would state that only adjectives can be modifiers of nouns, and therefore any noun in the prenominal position must be an adjectival modifier 'in disguise' or the first element in a compound. So what exactly are the criteria for identifying this division?

As was stated in the introduction, my aim in this dissertation is to provide evidence for the syntactic origin of at least some of what have previously been placed under the label of compound. The lexical status of all exocentric compounds is fairly uncontroversial[8], as is that of synthetic compounds[9], and will therefore not be discussed further here. I also exclude coordinate compounds given that, similar to exocentric compounds, they do not have an identifiable head inasmuch as they are generally analysed as either having two heads (see in particular Bisetto & Scalise (2005: 328)) or no head whatsoever (Booij (2005: 80)). However, the case for endocentric subordinate and attributive compounds is the topic of some debate. Indeed, much literature has been devoted to the search for a precise

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[8] Giegerich (2004: 6) notes that "[...] there is no productive morphological process in Modern English that generates exocentric ('bahuvrihi') constructions like [red-shank] which denotes a bird while [silverfish] is an insect, not a fish".

[9] See in particular Lieber (1994) and Roeper and Siegel (1978) and also the discussion in Giegerich (2004) where it is claimed that these complement-head constructions are not generated elsewhere by the syntax. Although I will not directly investigate the behaviour of synthetic compounds regarding the compound/phrase distinction, deverbal nominalisations (e.g., *basket production*, *speech synthesis*), not considered "synthetic" (see Bauer (2001: 701), and fn.6 above), will be discussed in later chapters, particularly in chapter 5 where the lexical status of any deverbal nominal construction, synthetic compounds included, will be put into question. See also fn.22.

definition of a nominal compound in English[10], and distinguishing them with respect to phrasal constructions has proven to be an arduous task. The criteria often invoked for doing this will be reviewed in the next section (§2), taking into consideration the problems that arise and evaluating how each criterion can contribute towards identifying lexical and phrasal NN constructions (henceforth NNs unless we directly refer to literature on compounds or phrases). Finally, some general conclusions will be presented in section 3.

2. Generalisations about phrases and about compounds, and the 'compound criteria'

The literature on compounding includes numerous observations about the characteristics of compounds, in a general attempt to distinguish them from phrases (for a general overview of the criteria, see in particular Sadock (1998), Bauer (1998b)). In particular, compounds are said to be distinguished by their "isolation" with respect to their phrasal counterparts, a term used in seminal works on English data by Chomsky and Halle (1968) in the Sound Pattern of English, and by Marchand (1969) in his examination of compounding in English. Although these analyses dealt mainly with phonological isolation (see below in §2.2), specifically the observation that English compounds typically stress the first element (henceforth fore-stress), contrasting with the usual end-stress pattern for phrases, the notion of isolation in a compound is not however limited to its phonology. Indeed, the Lexical Integrity Hypothesis (henceforth LIH – see among others Siegel (1974), Bauer (1978), DiSciullo & Williams (1987)), in particular, predicts that a true 'compound' (lexical in nature) will resist syntactic modification of any of its elements. Consequently, grammatical isolation should be a distinguishing feature of compounds, a word form whose internal structure cannot undergo syntactic processes such as co-ordination, number morphology assignment or *One*-substitution, etc.

Overall, one of the more recent and most integral definitions of a compound can be found in Bauer (2001: 695), who suggests that a compound could be defined as:

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[10] Not only in English. However most work has concentrated on English data given the lack of nominal compound morphology present in many other languages.

(2)   "[...] a lexical unit made up of two or more elements, each of which can function as a lexeme independent of the other(s) in other contexts, and which shows some phonological and/or grammatical isolation from normal syntactic usage."

In addition to phonological and grammatical isolation, many compounds also exhibit some semantic specialisation, although the literature has suggested that this is less reliable than the afore-mentioned criteria[11]. Indeed, there are many exceptions – what would be considered compounds which are not at all semantically specialised, and apparent phrases which are – as is also the case for the proposed phonological and grammatical isolation.

To go even further, Bauer (1998b: 81) claims that if there were a distinct line between a compound and a phrase, we would expect to find prototypical examples of each, but this is not the case. There are however, some generally accepted features of syntactic constructions.

Syntactic constructions are said to be a) semantically transparent and compositional, b) end-stressed[12] (in English), and c) the outcomes of fully productive (rule-governed) processes[13]. We will see that this transforms into three main assumptions regarding nominal compounds: semantic isolation (§2.1), phonological isolation (§2.2) and grammatical isolation (§2.3). A fourth area which must be addressed regards the latter. Specifically, the observation that syntactic constructions are outcomes of fully productive processes would suggest that compounds are not. Contrarily, it is well attested that new NN compounds can be freely and productively formed. This will be treated separately in section 2.4.

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[11] Other two criteria to have often been proposed are 'listedness' and 'orthography'. I take listedness to be more or less the same as 'lexicalised', and orthography is a fairly unreliable criterion given the variability in whether a compound is spelt as one word or not, e.g., *daisy wheel*, *daisy-wheel* and *daisywheel* (see Bauer (1998b) for further discussion). I do not see the need to discuss either two criteria here.
[12] Simplifying greatly the metrics of stress in general, by end-stress and fore-stress, in a two-element compound, I intend that the main stress is on the second of the two elements, and the first of the two elements, respectively.
[13] "[phrases] are assumed not to have lexical exceptions, not to be restricted by factors related to etymology, the word-classes involved, or demands for euphony." (Bauer (2006: 484)).

2.1 Semantic isolation

2.1.1 Compositionality

Syntactic constructions are compositional, that is, the meaning of the whole is a function of the meaning of its parts. For example, the interpretation of the DP *that men's 'room* lies in its structural configuration as a genitive DP: the N° "belongs to" (encoded in the Saxon genitive *'s* in D°) the dependent of D°. Similarly, the pre-head attributive position in a modifier-head configuration such as an adjective + noun construction (henceforth, AN), e.g., *black 'list*, or *good 'wife*, is one of ascription, whereby the modifier denotes 'a property which is valid for the entity instantiated by the noun' (Ferris (1993: 24))[14]. Thus, *the list* has as one of its properties the quality of being black, and *good* denotes a property of the wife.

The nature of ascription is such that the elements involved are interpreted through predication and the verb 'to be': A *black 'list* is a list that 'is' black, a *light 'house* is a house that 'is' light (as opposed to heavy or dark) etc. Ascription is characteristic of attributive adjectives given that they generally denote qualities (Ferris, 1993)). However, there also appear to be a limited class of nouns which may occupy this position[15], namely those that indicate 'material' (*metal*; *wood*; *steel* etc.): a *wood 'man* is a man that 'is' wood, or 'is/made of' wood and a *metal 'bridge* is a bridge that 'is/made of' metal. In addition, if a material adjective exists, with the only two in English still used to describe constitution being *woollen* and *wooden*[16], there does not appear to be any difference in acceptability or interpretation (2), suggesting that material nouns are used more or less as true adjectives[17].

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[14] Following Payne & Huddleston (2002), the only other option for an adjective according to Giegerich (2006: 11ff.) is association. These 'associative adjectives' will be addressed in the next chapter. Giegerich furthermore claims that adjectives are typically ascriptive, while nouns are typically associative (2006).

[15] There are numerous additional instances of what would appear to be ascription in NNs inasmuch as the relationship between the two elements in such constructions can also be paraphrased by 'is': *toy 'gun*, *barrier 'reef*, *bit 'part*, *ball 'bearing*, *trial 'run*, *woman 'teacher*, *boy 'student* to name a few (taken from Liberman & Sproat (1992) and Levi (1978)). Giegerich considers these NNs to be the same group of constructions as 'is made of' where the latter is inferred if the modifier refers to a material (2006: 13), and argues that they are phrasal, as are all attributive-head constructions (p.14ff.) with noted exceptions (those that are lexical for independent means). While I do agree with Giegerich's claim that NNs such as *boy 'student*, *toy 'gun* etc., are potentially syntactic in origin, I will ultimately exclude them from my analysis in chapter 5, focusing solely on 'material', based on the general theoretical paradigm I adopt in chapter 4.

[16] Adjectives such as *silken* and *metallic*, for example, have clearly different metaphorical interpretations: *her hair was silken and her eyes metallic*.

[17] As will be further discussed in chapter four, I follow Scott (2002) and assume that 'material' is in actual fact an adjectival class.

(3)   a.   *the rug is woollen*   cf. *the rug is wool*

      b.   *the clock is wooden*   cf. *the clock is wood*

Thus, on the principle that ascription is syntactic, which follows on from the nature of the attributive modifier + head configuration described above, ANs and NNs which express the ascriptive IS and MADE OF[18] relations are therefore compositional.

Where syntactic constructions are compositional, compounds, as lexical constructions, at first glance, are not. That is, their interpretation cannot be deduced from a syntactic modifier + head configuration:

(4)   a.   **Phrase**   b.   **Compound**

           wood(-en) 'man   *'woodsman*

           black 'list   *'blacklist*

           good 'wife   *'housewife*

           new 'glasses   *'sunglasses*

           steel 'ship   *'mother ship*

           glass 'bottle   *'milkbottle*

           hot 'pan   *'saucepan*

           plastic 'brush   *'toothbrush*

A *mother ship* is not a ship which is a mother, but any vessel which controls its fleet from a distance and a *housewife* is not a wife that is a house in any way whatsoever, but a woman (not necessarily married) who does not work and takes care of her home and/or children.

Compositionality is not, however, limited to syntax. Many derived "words" are also compositional with respect to their morphological configuration. The interpretation of a morphologically complex word is produced by the semantics of the base and of its affixes:

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[18] Following Levi's (1978) notation, I employ capital letters when referring to the specific semantic relation between the elements in a nominal construction (what she refers to as 'complex nominal', to be discussed in the next chapter).

(5)   a. *nonconcatenative*
         $_V$concatenate [non- +   +Neg
                      + -ive$_A$]   'tending to V'

     b. *institutionalisation*
         $_N$[$_N$institution + -al$_A$ 'relates to N'
                      + -ise$_V$ 'to make A'
                      + -ation$_N$]   'state of V'

     c. *unanswerably*
         $_V$answer   [un- +   +Neg
                      + -able$_A$ 'able to V'
                      + −y$_{Adv}$]   +Adv

     d. *antidisestablishmentarianism*
         $_V$establish   [anti- +   'against'
                      dis- +   'undo'
                      + -ment$_N$ 'result of V'
                      + -ari$_A$ 'rel. to N'
                      + -an$_N$ 'person who is A'
                      + -ism$_N$]   'doctrine of person-N'

Thus, compositionality is relative, and a circular argument if used to distinguish a compound from a phrase. That is, where there is a configurational structure, into which either morphemes or lexemes are inserted, providing the correct interpretation, we can say that the resulting construction is compositional. NN compounds, therefore, may in fact be compositional if there is a regular underlying configuration, regardless of whether it is morphological or syntactic. In fact, many of the NNs claimed above to be compounds (4b) do appear to have the same general interpretation of 'for', suggesting regularity: *sunglasses*, *milkbottle*, *saucepan*, *toothbrush*, *housewife*. The semantic relation 'for' is just one of a number of possible relations between the elements in an NN structure, e.g., *student power* 'genitive' (cf. the synonymous *student's power*) or *hotel room* 'located in', *tax law* 'about', *knife wound* 'with', etc[19].

If these semantic predicates are indeed configurations available to morphology, a true lexical NN can in fact be considered compositional, at least morphologically. However, if these semantic predicates are instead syntactic configurations, it stands to reason that many

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[19] See Levi (1978), also discussed in chapters 2 and 3.

NNs may in fact be syntactic. In both cases, lexical and syntactic NNs can be compositional. We therefore need to turn to other criteria for a clearer distinction between a phrase and a compound.

2.1.2 Transparency

Like compositionality (although usually reserved for compounds), semantic transparency is a term that refers to the relationship between the constituents and the whole. A compound is semantically transparent if the meaning of the construction can be deduced from combining the meanings of both of its parts[20]. Thus, the constituents in syntactic configurations are by and large transparent given that the structure provides the interpretation, and many compounds are fully transparent (contra Jespersen (1942: 137) among others), such as *sunglasses*, *milkbottle*, *saucepan*, *toothbrush*, while others are opaque, such as *mother ship*, *housewife* (and all exocentric compounds).

Under this line of argument, semantic transparency on its own will not be able to distinguish a phrase from a compound, especially given that many morphologically complex lexemes are in fact transparent (e.g., *kindness*, *uneven*, and those given in (5) above). A phrase-compound dichotomy based on transparency therefore relies on the definition of which semantic predicates are predicted by syntax, and which, on the other hand, are only available in the lexicon.

Given any two nouns, one can easily perceive linking them by 'for', a grammatical adposition, whereas linking them by a semantic predicate such as 'N° acts as N_1 from a distance' – the interpretation necessary for *mother ship* – is far less evident. The ease of combination would seem to follow on directly from the inherent function that a noun has. Pustejovsky (1995) outlines three dimensions for the interpretation of any noun (p.142):

(6)

> (A) Argument structure – how many arguments the nominal takes, what they are
>
> typed as, whether they are simple, unified or complex.

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[20] But see Libben et al. (2003) who suggest it may be more useful to consider transparency in terms of either one of its constituents.

(B) Event structure – what events the nominal refers to, both explicitly and implicitly.

(C) Qualia structure – what the basic predicative force of the nominal is, and what relational information is associated with the nominal, both explicitly and implicitly.

While a noun's argument structure and event structure are important considerations for deverbal nominals[21], the most relevant aspect for simple N°s regards specifically (C), the *qualia structure*, inasmuch as it provides us with an insight into the 'relational information' between head and the pre-head element. In Pustejovsky's notation, there are four kinds of predicative information implied in the semantics of the category 'N', leading to four roles, or *qualia*:

(7) (i)   its origin   (agentive quale)

     (i)   its function or purpose   (telic quale)

     (ii)   its components   (constitutive quale)

     (iii) how it is distinguished in a larger domain (formal quale)

While the *formal quale* of a noun is generally manifested in its relation with a predicative adjective (Fábregas (2007: 7)), a noun's *agentive, telic* and *constitutive* qualia can be expressed by a modifying element in a compound (see Johnston & Busa, 1996). Thus, translating the qualia into semantic relations (examples from Johnston & Busa (1996: 1[22])):

(8) a. *bullet hole; lemon juice*   AGENTIVE   'from'

     b. *bread knife; credit card; race car* TELIC   'for'

     c. *glass door; silicon breast*   CONSTITUTIVE 'made up of'

However, the qualia notion on its own does not provide any insight into whether the qualia are realised within the NN through a syntactic or morphological process, nor does it predict

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[21] In Ch.3: §3 we will assume along with Bosque & Picallo (1996) that argument structure can be present within prenominal modification of a deverbal nominalisation. See also fn.10.

[22] These examples are given for Italian, translated into English here for descriptive purposes. It must be pointed out, however that by *glass door* they refer to *porta a vetri*, or 'door made up of glass', perhaps similar to a stained-glass door, and by *silicon breast* they mean *seno al silicone*, where the silicon 'makes up' the breast. This distinction will prove to be important in Ch.5 (§3.1).

other semantic relations such as 'located in', 'time' and 'with' which, in the literature, have been considered transparent. As an example, it is well attested[23] that NNs whose modifier introduces a time relation (9a) have syntactic qualities. Payne and Huddleston ((2002), henceforth P&H) furthermore claim that (9b-d) are syntactic by demonstrating that such NNs adhere to grammatical constituency tests (p448-449), to be discussed below (§2.3).

(9)	a.	*winter 'holiday*, *morning 'coffee*	TIME
	b.	*London 'college*, *Oxford 'high-school*	IN
	c.	*cooking 'apple*, *bathroom 'towel*	FOR
	d.	*gas 'cooker*, *steam 'radiator*	WITH

The constructions which display these transparent relations are referred to as 'associative NNs' where the pre-head element "does not apply directly to the denotation of the head nominal, but rather to some entity associated with it" (P&H: 556) In the literature, ascription and association are thus conflicting terms, but both potentially possible within (syntactic) attributive modification (see Giegerich (2006)). If this is so, we would subsequently need to allow for certain N_1s to be nominal modifiers in a syntactic configuration that expresses an interpretation other than the typical ascriptive IS. If the tests invoked by P&H do in fact identify syntactic constituents, and considering that all of (9) are end-stressed, indicative of phrases (see §2.2) the interpretation must be syntactically compositional, the relation holding between the elements therefore being transparent. Notably, all semantically transparent NNs exemplified above are specifically those which can be paraphrased with prepositions with the exception of MADE OF. This will prove to be crucial in light of the discussion in chapter 4.

In chapter 3 we will discuss further the literature on semantically transparent predicates within nominals and in chapter 4, a theoretical paradigm for incorporating associative NNs into syntax will be proposed. For now, we can conclude that semantic transparency as a defining characteristic of a phrase, is predicted by the relation between its constituents (perhaps represented, although not entirely, by Pustejovsky's qualia structure). However,

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[23] See in particular Fudge (1984) and Kingdon (1959), cited in Giegerich (2009b: 9), and Liberman & Sproat (1992), cited in Bell (2005)).

this does not distinguish attested compounds such as *sunglasses*, *milkbottle*, *saucepan*, *toothbrush* from 'syntactic' NNs such as those in (9c) given that the relation is the same (FOR) in either case. In order to ascertain whether the compounds that manifest these transparent relations are formed in morphology or in syntax we again need to turn to other criteria.

2.1.3   Semantic specialisation and lexicalisation

A construction is semantically specialised if it has a particular interpretation that requires specific knowledge, often idiomatic, which can only be available in the lexicon. The examples in (4b) above are clearly lexical, but could have become so through one of two potential scenarios. Semantic specialisation can occur by default when a semantically opaque structure is formed in morphology, for example *mother ship*, *housewife*, or exocentric compounds such as *skinhead*, *white-collar*. Alternatively, it can be acquired diachronically, through the lexicalisation[24] (insertion into the listed vocabulary – see among others DiSciullo & Williams, 1987) of a productive syntactic (10) or morphological (11) construction over time[25].

(10)   a.   he quickly got $_{PP}$[to the point] → he was very $_A$[to the point]

b.   it was a very $_A$high $_N$risk to take → the offer is very $_A$[high-risk]

c.   don't trust anybody over 30! → the $_N$[$_{A/N}$[don't trust anybody over 30] crowd][26]

d. $_A$holy + $_N$day → $_N$holiday[27]

e. $_V$break + $_N$fast → $_N$breakfast[28]

(11)   a. $_N$[$_N$terror + -ism] 'the state of terror'

→ 'the use of violence for political purposes'

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[24] Semantic specialisation can be the result of having been lexicalised, but lexicalisation does not necessarily mean that a form will be semantically specialised. See §2.2.

[25] In fact, even an example such as *housewife* may have originally been constructed with a semantically transparent relation such as 'for' or 'of' ('?a wife FOR/OF the house') but has undergone lexicalisation, acquiring a more specific and fixed meaning. Again, whether the original construction site was morphology or syntax is not clear. See also §2.4 below.

[26] Liberman & Sproat (1992: 156)

[27] http://www.uni-due.de/SHE/HE_Lexicalisation.htm.

[28] Ibid.

b.   N[Ndirect + (e>o)r] 'a person who directs'

→ 'a person who direct films'

It is thus important to distinguish between two 'types' of lexical: those NNs constructed in the lexicon and those that have become lexical but are otherwise syntactic in origin. True NN compounds are claimed to be semantically specialised (e.g., (12b)) whereas phrases are not. However, certain NNs lack semantic specialisation (12a). Moreover, these non-semantically specialised constructions (in 12a) are end-stressed, while those in (12b) take fore-stress (deemed lexical):

(12) a.   **Non-semantically specialised**   b.   **Semantically specialised**

bathroom 'towel	FOR	*'handtowel*	FOR
mountain 'hut	IN	*'mountain hut*	IN
steam 'cooker	WITH	*'steam iron*	WITH
winter 'holiday	TIME	*'winter sports*	TIME

The NNs in (12) would all be semantically transparent according to the discussion in the previous section, but those in (12b) show some degree of semantic specialisation with respect to the corresponding structure in (12a): A *'handtowel* must be small whereas a *bathroom 'towel* can be any towel that is for the bathroom[29]; a *'mountain hut* has the connotation of being a special type of hut, perhaps designed specifically so as to resist mountain climates whereas a *mountain 'hut* is simply a hut located in the mountains; a *'steam iron* identifies a specific type of iron within the category of irons, whereas a *steam 'cooker* is a cooker that uses steam to cook; *winter 'holiday* is a holiday taken in winter while *'winter sports* are a class, or a 'type' of sports. Thus, semantic opacity and semantic specialisation, while similar criteria, are two separate qualities of compounds: the former refers specifically to the relation between the constituents, while the latter is a measure of how "fixed" or specific the overall meaning is.

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[29] Given that the N_1 is a locative noun, the IN interpretation could also be obtained. This ambiguity will be briefly addressed in §2.2.2 of this chapter and again in chapters 2 and 6.

Furthermore, among the fore-stressed examples are varying degrees of semantic specialisation, often depending on frequency of use and frequency as one item. For me at least, '*winter sports* and '*mountain hut* are more specific and lexicalised than '*steam iron*, for example. That is, there are far more connotations associated with the sports classified as '*winter sports* and with the type of hut referred to with '*mountain hut* than there are with '*steam iron*.

Given that fore-stress correlates with both semantic specialisation (12b) and lexical constructions (see the next section, §2.2 below), it seems fairly plausible to claim that semantic specialisation indicates lexical status. On the other hand, end-stress seems to correlate with a lack of semantic specialisation (12a). There are, however, counter examples which will be addressed in the next section (2.2) (due to the phonological nature of the arguments).

Finally, lexicalisation (which generally leads to semantic specialisation) has been proposed as a feature of compoundhood given the supposedly "frozen" meaning of a compound. However, lexicalisation on its own cannot be a deciding factor when identifying a compound given that there are many nonce structures which will not have had the chance to be added to the listed vocabulary of English but yet have fore-stress and seem fairly semantically specialised (see Sadock (1998: 165)):

(13)   "*motor-votor*" *denial*, *skinhead brothers*, "*St.Elsewhere*" *star*

Conversely, there are NNs which appear to be syntactic by all other criteria (end-stressed, semantically transparent, non-semantically specialised and, adhere to syntactic constituency tests – to be discussed in §2.3) despite being established forms which are potentially listed in the lexicon[30]:

(14)   a.   *town* '*crier*, *London* '*fog*   IN
         b   *summer* '*fruit*, *November* '*rain*   TIME

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[30] Examples from Giegerich (2009b: 9)

The issue of lexicalisation will be taken up in the next section, where two issues brought up in the above discussion will be crucial: the correlation of fore-stress with NNs which identify a class or a 'type' of the hypernym N°, and the notion of degree of semantic specialisation.

2.2 Phonological isolation

According to traditional generative grammar (Chomsky and Halle (1968) and Liberman and Prince (1977)), in a neutral context, stress is assigned to a phrase's right-most element in English. For example:

(15)	a.	adjectival NPs	*large round red 'ball*, *beautiful French 'lady*
	b.	possessive NPs	*the queen's 'trousers*, *my uncle's 'car*
	c.	NumPs	*these three 'cars*, *the two beautiful 'shirts*
	c.	syntactic NNs	*metal 'bridge*, *plastic 'chair*, *cotton 'shirt*

Phrases may not take fore-stress, unless in specific, usually comparative, contexts[31]. Contrastingly, fore-stress is one of the more wide-spread features of English compounds, as can be demonstrated through comparing the examples in (4), reiterated below in (16), which show semantically specialised and/or opaque, fore-stressed constructions and the semantically transparent, end-stressed examples that lack semantic specialisation.

(16)	a.	**Phrase**	b.	**Compound**
		wood(*-en*) *'man*		*'woodsman*
		black 'list		*'blacklist*
		good 'wife		*'housewife*
		new 'glasses		*'sunglasses*
		steel 'ship		*'mother ship*
		glass 'bottle		*'milkbottle*

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[31] Liberman and Sproat (1992) speak of FCA effects: stress situations determined by Focus, Contrast, or Anaphora. Some examples are given in (i), where the bold type indicates the main sentence stress (p.134):
(i)   a.   We're only concerned with **solvable** problems
          b.   He replaces his **low-interest** bonds with **high-interest** bonds
It is not within the scope of my dissertation to delve deeper into these phenomena. It will suffice to point out that by a construction's fore-stress or end-stress we intend the stress pattern in a neutral context. That is, in Liberman & Sproat's terms, free of FCA effects.

hot 'pan	*'saucepan*
plastic 'brush	*'toothbrush*

This feature supposedly reflects the 'word' status of a compound given that the general stress pattern for true lexical words in English is fore-stress[32] unless the head branches, in which case Liberman and Prince's (1977: 257) prominence relation comes into effect:

(17)   "In any pair of sister nodes [AB]L where L is a lexical category, B is strong if it branches."

Furthermore, in accordance with the observation that fore-stress is inadmissible in phrases, it seems logical that fore-stress in an NN construction is only available in the lexicon (Giegerich, 2009a: 17ff. and works cited therein).

From the data in (16), the stress criterion can seemingly predict the distinction between a phrase and a compound. However, in early work on compounds in English, Lees (1963: 120) discussed a group of NNs that are problematic for any theory which claims a strict compound-phrase divide based around the notion that compounds are fore-stressed and phrases are end-stressed. This group includes examples such as the variably stressed *ice-cream*, and the fore-stressed '*apple cake* and '*Madison Street*, compared to the end-stressed *apple 'pie* and *Madison 'Avenue*, or *Madison 'Road*. The problem therefore lies in accounting for end-stressed lexical items.

Even further back than Lee's seminal work, Bloomfield (1933: 228) had claimed that *ice-cream* was in fact a compound for some people and a phrase for others, depending on where the stress was placed. The more accepted theory until recently has been that while fore-stress in compounds is usual, end-stress is 'exceptional'. Some have argued that this exceptional end-stress pattern is unpredictable and therefore discredits the use of stress as a criterion for the distinction between a phrase and a compound (Levi (1978:39-48), Bauer (1978; 1998b)).

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[32] But see some exceptions in Giegerich (2004: 4)

However, referring to much of the work carried out by Giegerich (2004; 2006; 2009b), I will argue that, on the contrary, end-stress in what has been given the label 'compound' is generally[33] confined to a small group of lexicalised attributive constructions which have either exceptionally maintained end-stress during lexicalisation, having resisted semantic specialisation in the process. My claim is that fore-stress accurately identifies compounds which are semantically specialised or are of the kind which have a purely classifying role, whereas end-stress and lack of semantic specialisation taken together indicate a construction which has a descriptive and underlyingly syntactic interpretation.

2.2.1 The correlation of fore-stress with semantic specialisation and classification
The first set of data concerns the *street* Vs. *road, avenue, boulevard* or *station* NNs, whose head consistently takes end-stress, despite being listed place names for most speakers.

(18)   a.   *Madison 'road*, *London 'road*, *Shoreditch 'road*

        b.   *Union 'station*, *Piccadilly 'station*, *London 'station*

        c.   *Park 'avenue*, *Madison 'avenue*

        d.   *Santa Monica 'boulevard*, *Hollywood 'boulevard*

(19)   *'Madison / 'Sydney / 'Oxford / 'Park street*

Searching for an explanation for the differences between the *road* examples in (18) and NNs headed by *street* (19), Giegerich suggests (2004: 14) that while NNs headed by *street* are arbitrarily named after people or places, those headed by *road* are ways of passage 'to' an area. I would like to extend Giegerich's observation and suggest that this may also be valid for all of *station*, *avenue*, and *boulevard*: *Piccadilly station* is a station 'at' or 'in' Piccadilly (circus); *Madison avenue* is an avenue that runs 'to' or 'from' Madison (square) and *Santa Monica boulevard* is a boulevard 'in' Santa Monica.

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[33] But see §2.2.2 which discusses some semantically specialised end-stressed constructions. Such constructions, however, are limited to those which perform a naming function and which typically take modifiers expressing 'colour'.

Whether we want to claim that there is a TO, an AT and a FROM relation in addition to IN within potentially syntactic (attributive) modifiers will not be addressed in this chapter (returning to it in chapters 4 and 5). What is crucial is that among the examples in (18) and (19) there is strong evidence for a functional difference between a locative, descriptive, modifier and a classifying or naming function[34], correlating with end-stress and fore-stress, respectively.

End-stress is also found in numerous NNs that refer to fairly common cooking recipes (Giegerich, 2009b: 5ff.), again, potentially listed for a number of speakers. Interestingly, they show the same dissimilarity as above. Where the N_1s in (21) classify the N° and are often semantically specialised, those in (20) convey the exact constitution of the N°, i.e., describe a set of the N°, expressing the transparent MADE OF relation[35]:

(20)   a.   *chocolate / plum / pecan*   '*pudding* / '*pie*

         b.   *lemon / apple / avocado / walnut*   '*tart* / '*flan*

         c.   *pumpkin / chicken / beef / onion*   '*soup* / '*casserole*

(21)   '*chocolate* / '*plum* / '*pecan*   *cake / biscuits*

Importantly, as was mentioned in the previous section (§2.1.3, above), all of the end-stressed constructions in (18) and (20), (as well as those in (14), e.g., *town* '*crier*, *London* '*fog*, *summer* '*fruit*, *morning* '*coffee* etc.) despite probably being listed for most speakers, are not opaque and are not semantically specialised, unlike the semantically opaque

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[34] This distinction was pointed out in early work on compounds by Zimmer (1971) and Downing (1975), discussed in Levi (1978: 61): "Thus, both Zimmer and Downing emphasise the difference in function between phrases which describe, and compounds which name; in addition, Downing notes that the naming function of compounds should also be distinguished from the asserting function performed (she claims) by sentential paraphrases of compounds (Downing 1975: 42)". The distinction between phrases and compounds referred to by Levi (1978) directly compares a sentence ('Hey, there's a cloud that looks like a kangaroo!" (p.61, 3.9a)) with a true compound ('Hey, look at that kangaroo cloud' (p.61, 3.9b)), whereas in the present work we are comparing a phrasal NN with a compound NN. However, I would tend to believe that the distinction is still the same. That is, one between a syntactic describing function (or an asserting one relative to the sentential paraphrasing of compounds, cf. Downing) and a purely naming function.
[35] A similar argument could be made for the difference between *Christmas* '*pudding* and '*Christmas cake* where the former is in a general sense pudding 'for' Christmas, while the latter is a specific type of cake. Some may claim, however, that even *Christmas* '*pudding* is a specific type of desert. While this may be true for many people, it seems to me that there is nonetheless a difference in degree of semantic specialisation between the two constructions.

constructions mentioned in the discussion above. Their fore-stressed counterparts, on the other hand, are generally semantically specialised and have a purely classifying role. That is, they indicate a specific type of the N° rather than the entire constituency: '*pecan biscuits* do not necessarily need to be made entirely of pecans but may in fact be made of chocolate giving us *chocolate* '*pecan biscuits*.

All the data have so far pointed towards end-stress correlating with lack of semantic specialisation. It therefore seems theoretically advantageous to tentatively maintain the stress criterion as indicative of the syntax/morphology divide and to claim that any end-stressed NNs listed in the lexicon, having not been semantically specialised, have in fact been able to maintain their syntactic stress pattern. The alternative, that end-stress is exceptionally assigned in the lexicon, is a principle that would compromise modularity[36] given that fore-stress correlates separately with all of semantic opacity, semantic specialisation and a classifying function.

It is important to point out that while classifying constructions may be semantically specialised, they are not necessarily so, despite taking fore-stress. We mentioned that '*handtowel* and '*mountain hut* have specific connotations, however there are constructions which simply identify a subcategory of N° such as '*art books*, '*Griffins biscuits*, '*health food* etc. Word-formation of this type can only be lexical, given that fore-stress is consistently assigned. Thus, semantic specialisation seems to point towards fore-stress, but not vice-versa.

If what I have claimed here is on the right track, we would consequently be able to account for those constructions which have variable stress, either for individual speakers, or within the language. For example, many NNs which express Pustejovsky's (1995) 'agentive' quale, specifically those that are headed by words that refer to food products such as *oil* and *juice* (*olive oil*, *avocado oil*, *corn oil*; *orange juice*, *apple juice*, *carrot juice*), supposedly

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[36] See Giegerich (2006; 2009b) and references therein for a similar affirmation.

have variable stress. If this agentive relation 'FROM[37]' is syntactic, these forms may maintain end-stress upon lexicalisation, if they have not undergone a process of full semantic specialisation, that is, the construction *orange 'juice* maintains the interpretation of 'juice from an orange'. On the other hand, the speaker who assigns fore-stress identifies '*orange juice* as a specific type of juice, i.e., the NN has a naming or classifying function. In both cases, the NN may be stored as a whole in the lexicon, only the fore-stressed structure identifies a specific class of N° while the end-stressed structure provides us with the underlying relation between the two elements. This could also be the case for *ice-cream*, presumably lexical for almost all English speakers: for the speakers for whom it takes end-stress, *ice* may in fact be considered an attributive modifier while the structure is lexical nonetheless.

Another option could be analogy. Giegerich (2004:10) stipulates that unlike the general syntactic pattern for attributive NNs, certain fore-stressed attributive NNs are formed in the lexicon, through analogy, which, he suggests, is probably no different from a fully productive morphological process: if *olive oil* has fore-stress, or alternatively end-stress, for a speaker, that same speaker is likely to produce, by analogy, any new oil, like the relatively new *avocado oil* or *tartufo oil*, for example, with the same stress pattern. It does not seem to me that analogy alone can explain the correlation between lack of semantic specialisation and end-stress. Nonetheless I agree with Giegerich that it may be available.

Additional support for fore-stress not being obligatory upon lexicalisation comes from a particular group of Scots[38], for whom, as Giegerich (2004: 11) notes, the following transparent NNs all have end-stress but would have fore-stress for most (Southern British) English speakers:

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[37] We will later refer to this relation as SOURCE (see Ch.5: §3.7).

[38] In the Scottish Borders and Lothian area – Giegerich cites personal communication as the source for these judgements, saying that it was also pointed out to him that it is particularly common in the older generations (Giegerich (2004: fn. 14).

(22)   *horse shoe*   *mars bar*

                 post office   *bread roll*

                 dough nut   *motor bike*

                 road end   *sea water*

Furthermore, many Scottish place names are end-stressed, and are in fact commonly mispronounced by other English speakers who tend to give them fore-stress (p.11):

(23)   *Bonnyrigg*   *Caddonfoot*

                 Clovenfords   *Newtongrange*

                 Gorebridge   *Rosewell*

To say, therefore, that both groups of end-stressed NNs (22) and (23) are lexicalised for most, but not for this particular group of speakers, seems implausible. Instead, Giegerich suggests that the attribute-head construction for these Scottish speakers maintains its end-stress because there is no 'pressure' on lexicalised items to change stress.

While it is evident that not all attributive NNs maintain their end-stress if lexicalised in other varieties of English, the difference between the two varieties seems to be that Scottish English prefers the syntax as construction site for all attributive NNs, while other varieties of English have the possibility of constructing the same forms in the morphology where they provide a classification of the N°[39].

In summary, if end-stress were freely assigned in the lexicon, Occam's razor would be breached, where this principle is instead desirable in a modular approach of the language faculty. In order to account for end-stress in lexicalised NNs, therefore, it seems plausible to claim that the few examples we find are in fact syntactic in origin, which have been able

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[39] An informal survey of some speakers (myself included) of New Zealand English, which displays some carry over from the Scottish language in some parts of the country (see Warren & Bauer (2007: 580ff.)), revealed that a few of these NNs are more often than not end-stressed in this variety, notably: *post office*, *salt water*, *horse shoe*, *road end.* In addition, there seemed to be a notable difference between the older and the younger generation, as could perhaps be expected if this is indeed a residue feature of their Scottish ancestors. However, given the extent of individual variation within these forms in general (Laurie Bauer: personal communication), and the limited population considered, I do not wish to draw any conclusions here.

to maintain their end-stress pattern in the lexicon due to lack of semantic specialisation. On the contrary, fore-stressed semantically transparent NNs appear to be one of two types: 1) they are constructed in morphology so as to provide a classification of the hypernym N°, with or without semantic specialisation (e.g., '*handtowel* and '*art books*, respectively) or 2) they have acquired fore-stress through both lexicalisation and semantic specialisation where the meaning becomes fixed over time and with frequency of use (perhaps *toothbrush*, *woodsman*, etc.). In this sense, the terminology 'compound' may not be truly applicable to all NNs found in the lexicon. That is, as Bauer points out (2006: 486-487), a lexicalised phrase is still considered a 'phrase' after going through the process of lexicalisation.

With fore-stress being available only in the lexicon, morphology therefore seems able to produce NNs that display the same inter-elemental 'relation' as NNs found in syntactic-like NNs (e.g., FOR, IN, etc., as per the data in (12)). There is, however, some apparent counter-evidence, to be discussed below.

2.2.2 Counter-evidence

Firstly, Giegerich (2004: 8) points out that the NNs in (24) below necessarily have fore-stress, as we would expect if these have been lexicalised, or alternatively, constructed in the lexicon as 'classifying' NNs. Each relation in (24) could loosely be referred to as FOR (taken from Giegrich (2004: 8)):

(24) a. '*toy factory* factory that makes toys/FOR

b. '*tear gas* gas that produces tears/FOR

c. '*hair net* net that holds hair/FOR

d. '*hair oil* oil for hair/FOR

However, when end-stressed, Giegerich claims that their default interpretations is one of the ascriptive MADE OF, as shown in (24).

(25) a. *toy* '*factory* "factory that is a toy"

b. *tear* '*gas* "gas made of tears"

c. *hair* '*net* "net made of hair"

d. *hair* '*oil* "oil made of hair"

This would seemingly go against any analysis whereby certain associative relations are configured in syntax, as we would expect to be able to obtain one of these associative interpretations when end-stress is present, i.e., a gas WITH tears, or oil IN/ON the hair. If there is indeed a syntactic FOR relation, and if end-stress is assigned, we should theoretically be able to obtain the same FOR interpretation in (25) as there is in (24). This is evidently not the case for Giegerich, and he in fact refers to the examples in (24) as necessarily complement-head.

However, as was seen above in (9), there are indeed some end-stressed, or variably stressed, NNs that manifest the FOR relation, e.g., *cooking 'apple* and *bathroom 'towel*. It seems to me that from *cooking 'apple* we can subsequently imagine something like a *cooking 'net* and from there perhaps accept a *hair 'net* where the *net* is 'for' the hair. That is, the MADE OF interpretation is perhaps the more obvious reading available in an end-stressed construction, but I do not believe it is the only one.

Secondly, as pointed out by Bauer (1998b; 2001; 2004; 2006), there are a number of semantically specialised classifying APs e.g., *brown 'rice*, *green 'light*, *white 'coffee*, *red 'squirrel*, *brown 'bear*, *blue 'bear* etc., which do not manifest fore-stress. It is likely that for most English speakers these forms are listed, especially seeing as we are unable to modify the pre-head constituent (see also §2.3.3 below): **very brown rice*, **a redder squirrel* etc. Following the claims made here, if they have been lexicalised from syntax, the question is why should they not acquire fore-stress if they have become semantically specialised?

Additional counter-evidence can be found in constructions which involve a proper name or institution such as *the Strawberry 'Fields*, *Times 'Square*, *Harvard 'College*, *Notown 'Hospital* etc. All of these are clearly lexicalised, but are nonetheless end-stressed. However, as Bell (2005) shows in detail, these constructions do not allow *One*-substitution or Ellipsis (see also Ch.3 §5), and furthermore, they are not particularly semantically specialised.

It must be pointed out that even common names are end-stressed (*Noam 'Chomsky*, *Laurie 'Bauer*, *Guglielmo 'Cinque*, etc.) suggesting that constructions which perform a purely naming function are perhaps formed through a unique process, different from the fore-stress assigned through semantic specialisation and perhaps even different from the classifying function seen in '*Griffins biscuits* and '*art books* etc., but which occurs within the lexicon nonetheless. Examples such as *brown 'rice*, *green 'light* and *red 'squirrel* (which notably all take a colour modifier) may have been constructed through the same process.

Although desirable, it is not my aim here to provide a clear-cut definition of a compound. I merely suggest that it is theoretically advantageous if end-stress is assigned in one module only, which does not preclude the possibility of lexicalised end-stressed constructions, i.e., end-stressed lexical items. For the present purposes, I wish only to isolate the features which point towards "syntactic-like" status, and, given that it generally correlates with lack of semantic specialisation, end-stress is seemingly one of them.

2.3 Grammatical isolation[40]

According to the LIH (see the introduction of §2 above), the elements within a compound should be invisible to syntactic processes. This is borne out in the impossibility of coordinating either element, substituting the N° with *one*, modifying or pluralising the first element, or obtaining anaphoric reference. The data in (§2.3.1 – §2.3.5) show a direct contrast between the behaviour of attested NN compounds[41] and of phrases with respect to these tests. NNs which manifest syntactic qualities (such as semantic transparency and end-stress for example) are shown to generally adhere to all constituency tests.

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[40] I must make it clear that the judgements on acceptability of the constructions in this section, and indeed in this dissertation, are mine unless otherwise stated (i.e., when taken from specific sources). Many speakers will not agree due to what in actual fact I am claiming here, that is, that there are varying degrees of lexicalisation, semantic specialisation and opacity within NNs.

[41] In order to demonstrate that the criteria are partially correlated, I have attempted to use the same lexical compounds in all tests, where possible. Certain examples did not have clear phrasal counterparts, or were unable to be potentially pluralised, etc.

2.3.1 No co-ordination

It is generally possible to co-ordinate two of the same types of syntactic constituents with the conjunction 'and'[42]. The examples in (26) show that neither element of a lexical NN allows coordination, but that syntactic constituents (PPs in (26a); N°s in (26b, d); VPs (in 26c) do.

(26)   a. '*sunglasses*

        [['reading and 'sun] glasses]   cf. I have my glasses for reading and for the sun.

        ['sun [glasses and case]]   cf. I have my metal (and steel) 'glasses and 'case.

    b. '*mother ship*

        [['son and 'mother] ship]   cf. I have the ship that resembles my mother and son.

        ['mother [ship and station]]   cf. I have my green (and red) 'ship and 'station.

    c. '*housewife*

        [['work and 'house] wife]   cf. My wife cleans our house and goes to work.

        ['house [wife and mother]]   cf. The young (and beautiful) 'wife and 'mother.

    d. '*toothbrush*

        [['gum and 'tooth] brush]   cf. I have the brush for my 'teeth and 'gums.

        ['tooth [brush and paste]]   cf. I like my red (and green) 'brush and 'paste.

However, coordination can occur in constructions that would be considered compounds according to our fore-stressed criterion even in particularly lexicalised and semantically opaque structures, as long as context is laid out[43] (27g). What is interesting to note, however, is that the stress pattern shifts to end-stress in certain examples (27a-d).

(27)   a.   '*voter anger* → voter [anger and 'outrage]

    b.   '*science requirements* → [math and science] 'requirements

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[42] As has been noted (Bauer (1998b: 74)) coordination only seems possible between constituents which are not only of the same category but which also belong to the same domain or class. Indeed, this restriction also appears in entirely syntactic constructions if a qualitative adjective is coordinated with a classificational one: *Her beautiful and green dress was expensive* (cf. *Her beautiful and elegant dress was expensive*) and *I would like a fast and green bowling ball* (*I would like a fast and fluid bowling ball*). Therefore, the impossibility of coordination between elements of a compound may not necessarily have to do with the fact that it is a compound but because an inappropriate item with which to compare has been chosen. I have therefore chosen modifiers of the contextual comparative structure which are in the same domain as the modifier in the compound in question. For example, rather than comparing *mother ship* with *battle ship*, I use the novel *son-ship*.
[43] Examples (26f, g) taken from Bauer (1998b: 75).

c.   '*engine oil* → engine [oil and 'lubricant]

d.   '*sewing machine* → [knitting and sewing] 'machines

e.   '*Arnotts biscuits* → [Griffins and 'Arnotts] biscuits

f.   '*windmill* → We saw a landscape dotted with *wind-* and '*water-mills*

g.   '*buttercup* → "He has been breeding buttercups of different colours for some years now. His most successful hybrid is a buttercup with a lambent golden brown colour, that he is marketing under the name of honeycup. He hopes that his '*butter and 'honeycups* will prove a big success in the next few years."

While (27e-g) maintain fore-stress, the examples in (27a-d) all shift to end-stress. Interestingly, the relationship between the constituents in (27a-d) is potentially syntactic, that is, in (27b-d) the relation is the transparent 'for' and (27a) is something along the lines of the genitive (cf. *the voter's anger and outrage*). Contrarily, (27e) is a type or brand of biscuits, which, given its classifying function is likely lexical (cf. §2.1.3 and §2.2 above); (27f) is particularly semantically specialised; (27g) is in fact exocentric.

Therefore, upon coordination of either element in an NN, end-stress is seemingly preferred if the relation between the constituents is syntactically transparent and the construction as a whole is only partially semantically specialised, or not at all. This may be because the interpretation is predicted by some syntactic configuration, i.e., the NN is syntactically reanalysed. Notably, *windmill* manifests the relation WITH (shown elsewhere to be syntactic in end-stressed constructions), however is particularly semantically specialised and therefore unable to be seen into as per the LIH.

Additionally, it seems that coordination in semantically specialised constructions (27f, g) is only possible if the pre-head constituent is placed further away than its counterpart in the coordination structure, as the impossibility of (28a and b) shows:

(28)   a.   **water- and wind-mills*

        b.   **honey and buttercups*

In (28) 'windmill and 'buttercup behave like the compounds in (27). This further suggests that a reanalysis of the construction is forced where the constituents in a compound are less bound to each other by lexical qualities such as semantic specialisation.

As was mentioned above (re: the claims made by P&H), non-lexicalised NNs with transparent semantics also pass the same test, and the NNs which were originally fore-stressed (29c) or variably stressed (29d), again, become end-stressed:

(29) a.   *winter 'holidays* →   winter and summer 'holidays   TIME
                                    winter holidays and 'festivals

      b.   *kitchen 'sink* →   the kitchen and bathroom 'sinks   IN
                                    the kitchen sink and 'bench

      c.   *'reading glasses* →   my reading and long-distance 'glasses   FOR
                                    my reading glasses and 'monocle

      d.   *'gas cooker* →   my gas and steam 'cookers   WITH
                                    my gas cooker and 'heater

Again, we can suggest that a syntactic reanalysis is forced. Given that the nouns in an NN are also independent lexemes, vis-à-vis bound morphemes such as *–ness*, or *un-* (which are strictly banned from coordinative structures: **the cannibal –ness and –ism*, **the un- and pre- meditated crimes*), coordination is perhaps able to identify either element in a NN as a syntactic constituent, hence the shift to end-stress where possible, i.e., where there is a syntactic configuration available and where there is little or no semantic specialisation. If fore-stress remains, the pre-head elements appear to take on a purely classifying role rather than the associative present in (27a-d). That is, the relation between the constituents is still apparent in *knitting and sewing machines* (FOR), whereas the modifiers in *wind- and water-mills* no longer refer to the relation WITH, but merely classify the N°.

Alternatively, Booij (1985) and Wiese (1996: 69ff) (both in Giegerich (2004: 6-7)) suggest that it is not a syntactic operation, but a phonological process whereby identical phonological material is deleted. Some supporting evidence comes from German where phonological words can in fact undergo coordination despite being part of evidently lexical

constructions (see references above). In either case, coordination does not appear to be a purely syntactic process.

2.3.2 No *One*-substitution

If a noun is a syntactic constituent, it should be able to be substituted with *one* or *ones*; a lexical construction, on the other hand, should not allow for its internal structure to be seen by syntax. *One*-substitution should therefore be unable to identify a syntactic constituent:

(30)   a.   *I have my 'reading glasses but not my 'sun ones.

             cf. I have found my green 'glasses. Do you have my red ones?

       b.   *I have been to the 'son ship but not to the 'mother one.

             cf. I have been to the American 'ship. Have you seen the Russian one?

       c.   *I met a 'workwife the other day, but I still haven't met a 'house one.

             cf. I saw my beautiful 'wife yesterday, but still haven't met John's rich one

       d.   *I have my gum brush but not my tooth one.

             cf. I have the brush for my gums but not the one for my teeth

As was the case for coordination[44], transparent, end-stressed NNs allow *One*-substitution, as is demonstrated in (31), confirming what we have already discussed regarding the potential syntactic status of such structures.

(31)   a.   This year we took a winter 'holiday, but not a summer one.

       b.   We have ordered the kitchen 'sink, but not the bathroom one.

       c.   I have my long-distance 'glasses, but not my reading ones.

       d.   I have a steam 'cooker but not a gas one.

Bauer (1998b: 77), however, gives a number of sentences where the possibility of *One*-substitution in certain NNs, he claims, is not clear (the * for ungrammaticality are mine):

(32)   a.   I wanted a 'sewing-machine, but he bought a knitting one.

       b.   *I wanted a 'sewing-machine but he bought a washing one.

       c.   *I wanted a 'knitting machine but he bought a sewing one.

---

[44] Although, note that stress may not be correlated with this criterion as could be with coordination given that the context is one of direct comparison and fore-stress is therefore obligatory.

(33)   a.   ?Do you want a 'table-spoon or a serving one?

       b.   *Do you want a 'table-spoon or a tea one?

       c.   *Do you want a 'serving spoon or a table one?

Coming from the perspective that all of (the fore-stressed) '*sewing-machine*, '*knitting machine*, '*washing machine*, '*table-spoon*, '*serving spoon* and '*teaspoon* are lexical, any grammaticality of the (a) examples would be surprising. However, if we allow for varying degrees of semantic specialisation and/or lexicalisation, as I have argued in previous sections, it seems that the more lexicalised the construction is, the less acceptable *One*-substitution will be. In my vocabulary, at least, '*washing machine* and '*sewing machine* are more common, or lexicalised, than '*knitting machine*, suggesting why '*knitting machine* is more visible to syntax inasmuch as it is 'more transparent'. Similarly, a '*serving spoon* is less semantically specialised than a '*teaspoon* or a '*tablespoon* – any fairly large spoon could be used for serving, where a teaspoon is necessarily small, and a tablespoon has a specific round shape. Indeed, returning to the true compounds, which fail this test (29), the examples given were all semantically specialised and/or semantically opaque.

Given that '*knitting machine* and '*serving spoon* both have fore-stress, it would appear that *One*-substitution is therefore unable to uniquely identify syntactic structures, in that it also identifies some fore-stressed constructions. Interestingly, these two specific constructions, in the *One*-substitution context, seem to be reanalysed as classifying constructions. That is, they can be comparable to (34):

(34)   a.   Do you want the 'Griffins biscuits or the 'Arnotts ones?

       b.   Do you prefer 'science books or 'art ones?

While the (b) and (c) examples in (32) and (33) above have also in some way been forced into a classifying context, the result is ungrammatical because of stronger lexicalisation and/or semantic specialisation with respect to (32a) and (33a), and also to (34). The possibility of applying *One*-substitution to fore-stressed classifying NNs (lexical), more than likely follows on from the comparative nature of the *One*-substitution test in general. That is, we are comparing two items of the same category through fore-stress. What is

crucial here is that the items, despite being fore-stressed, are not overly semantically specialised. Thus, *One*-substitution is seemingly able to isolate independent syntactic constituents, involved in both lexical and syntactic constructions which show little or no semantic specialisation.

2.3.3 No modification of the first element

As would be predicted by the LIH, the first element in a lexical NN may not undergo modification:

(35)   a.   *[[*yellow* 'sun] *glasses*]   cf. The yellowest 'glasses.

         b.   *[[*beautiful* 'mother] *ship*]   cf. That very beautiful 'ship.

         c.   *[[*old* 'house] *wife*]   cf. The older 'wife.

         d.   *[[*clean* 'tooth] *brush*]   cf. An extremely clean 'brush.

Interestingly, Bauer (1998b: 73) points out that modification of the first element is however possible in certain lexical NNs:

(36)   a.   '*lending right* → [[public 'lending] right]

         b.   '*rail system* → [[light- 'rail] system]

         c.   '*noodle salad* → [[instant 'noodle] salad]

         d.   '*Fraud Office* → [[serious 'Fraud] Office]

         e.   '*car company* → [[used 'car] company]

In line with what we claimed in the previous section, the difference in behaviour between an attested compound such as '*toothbrush* and an example such as '*rail system* is that the former is particularly semantically specialised while the latter is not (and is a classifying construction).

Regarding end-stressed non-lexicalised semantically transparent NNs, we would expect them to behave positively with respect to this criterion. This prediction is in fact borne

out[45], even if less clear than with coordination and *One*-substitution, where the '?' refers to the assigned end-stress:

(37) a.   [*fresh fish*] ?'*shop*   FOR ?Class

      b.   [*rare manuscript*] ?'*room*   FOR ?Class

      c.   [*big kitchen*] '*sink*   IN

      d.   [*new steel*] '*bridge*   MATERIAL

      e.   [*natural gas*] '*cooker*   WITH

The examples in (37a) and (37b) sound odd because perhaps the original NNs are in fact classifying structures, argued above to be lexical, which would typically have robust fore-stress. It could be argued that in some cases, the AN constituent, for example *new steel* or *big kitchen*, is a compound in itself, as is the case for examples such as *used car* and *Fraud Office* where further modification of the adjective is impossible (**recently used car business* and **really serious Fraud Office*). However, if the original NN is not lexicalised (cf. the lexicalised '*rail system*), the relation between the N_1 and the N° is transparent and not classificational (cf. (37a/b)) and furthermore, end-stress on the N° is possible, I see no advantage in presuming compound status a priori.

Furthermore, the examples in (38), although quite forced, are not entirely unacceptable, suggesting that (37) do behave somewhat syntactically regarding this criterion.

(38) a.   ?[*extremely fresh* [*fish*]] '*shop*   'a shop that sells extremely fresh fish'

      b.   ?[*very rare* [*manuscript*]] '*room*   'a room for very rare manuscripts'

      c.   [*unusually big* [*kitchen*]] '*sink*   'a sink in/for an unusually big kitchen'

      d.   [*brand new* [*steel*]] '*bridge*   'a bridge made of brand new steel'

      e.   [*almost natural* [*gas*]] '*cooker*   'a cooker that uses almost natural gas'

The difference between the constructions in (36) and (37-38) seems to be that not only are the latter non-lexicalised and non-semantically specialised, but they also allow modification while maintaining end-stress. The examples in (36), however, maintain fore-stress on the

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[45] Examples (34a, b) are from Shimamura (2001: 1); (33c-e) are mine.

original NN, deemed to be typical of compounds (re: the prominence relation (Liberman & Prince (1977) referred to in (17) above).

Overall, it seems that the non-head constituent in lexical items can be modified, but a new compound is formed. Furthermore, they are constructions which show little or no semantic specialisation. Therefore, this criterion (similar to *One*-substitution) does not uniquely identify syntactic constructions, but instead identifies any NN which is not particularly semantically specialised. If we add the stress distinction to this criterion, however, we observe compounding (36) on the one hand and syntactic modification (37-38) on the other.

2.3.4 No number morphology on the first element

The first element in a true English NN compound is a bare noun, unable to display number morphology even though the compound implies a plural interpretation[46]. Contrastingly, pluralisation is possible when the N_1 is expressed in the form of a circumstantial PP forcing a transparent and non specialised interpretation.

(39)　a.　*'*sauces pan*　　　　　　cf. It is a pan for cooking sauces in.

　　　b.　*'*houses wife*　　　　　　cf. She is the wife at the two houses they own.

　　　c.　*'*teethbrush*　　　　　　cf. This brush for my teeth is not my toothbrush.

Occasionally, inflection is allowed inside NNs referred to as compounds[47], for example (Bauer, 1998b: 72-73):

(40)　a.　'*drugs courier*

　　　b.　'*games mistress*

　　　c.　[[[*British* '*Council*] *jobs*] *file*][48]

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[46] Genitive case inside a compound would also be prohibited according to the LIH but, as is well-attested, many genitive NNs, lexical in terms of stress, semantic specialisation and inability to undergo constituent tests occur in English, e.g., *bird's nest*, *bull's eye*, *fool's paradise*, *woman's magazine* (See Shimamura (1998) in particular for a wide variety). However, considering other languages, many use the genitive to indicate a compound (for example, Japanese and Turkish) and it may well be that in English the genitive modifier is reanalysed as one constituent, similarly to the plural. See Shimamura (1998) for this type of approach. It is for this reason that I have decided to exclude genitive NNs from my discussion.

[47] In addition, some Romance languages have the plural, or the imperative form inside compounds, e.g., in Italian *arruolamento volontari* "volunteers enlistment"; *trasporto merci* "goods transportation"; *elaborazione dati* "data processing" (Bisetto & Scalise, 1999) and in Spanish (*toca discos* – imperative + N (pl.) (Sadock (1998: 168)), respectively.

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Bauer (p.73) notes that the fore-stressed '*drugs courier* and its, again fore-stressed, singular counterpart '*drug courier*, seem to be used interspersingly displaying no particular difference in meaning. He furthermore suggests that the possibility of the plural 's' in compounds may not compromise the LIH given the difference between (40c) and [*British Council*][*job file*][49]. Thus while the plural is acceptable on the N° of a complex [NN]N modifier, it is not present on a single constituent. It would appear that the plural was assigned first to [[*British 'Council*] *job*], and then as one constituent, the entire [NN]N forms a compound with *file*. The LIH would predict that the entire [[*British 'Council*] *jobs*] could not be assigned number morphology, although it sounds wrong in any case, due to the eventual 'double' plural.

Number morphology can, at first glance, be found inside transparent NNs, although the evidence is substantially weaker than for the other criteria. Furthermore, end-stress is no longer possible:

(41) a.   ?A shop that sells tools: a 'tools shop.   FOR

     b.   The 'manuscripts room.   FOR

     c.   ?Next week's 'lakes run.   IN[50]

     d.   ?This is a 'kitchens sink.   IN

The examples in (41) considerably improve if we modify N_1, however, the NNs would appear to have formed a lexical constituent given their fore-stress :

(42) a.   There's a new electric 'tools shop.

     b.   The rare 'manuscripts room is quiet.

     c.   Next week's three 'lakes run.

     d.   This is a big 'kitchens sink.

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[48] Bauer (1998b: 73; 2006: 490) also notes that the 's' may be present in order to mark the immediate constituent structure, as seen by the difference between *British Council job file* and *British Council jobs file*. This would suggest that the –s is not in itself 'plural' marker, but an attributive one, and therefore no breach of the LIH.

[49] Bauer (1978: 40).

[50] The relation between the elements could also be 'at' or 'around' (see also §2.2.1 of this chapter)

Interestingly, the AN constituent, rather than act as an attributive modifier, seems to have more of a classifying role. While this type of construction is undoubtedly lexical (given the fore-stress pattern – if it were end-stressed the pattern would be *electric tools 'shop*), it seems analogous to the [[*British 'Council*] *jobs*] case above. In general the examples of lexical constructions that allow number morphology on the first element are very few, and it therefore may be a fairly robust criterion for compoundhood.

This does however pose a problem for the present analysis, that is, the NNs that up until now have behaved syntactically regarding other criteria do not allow number morphology on N_1, which, if they were truly syntactic, we would perhaps expect[51].

(43) a. *kitchens 'sinks*   IN

b. *gases 'cooker*   WITH

c. *bathrooms 'towels*   FOR

d. *winters holidays*   TIME

However, given the data above which suggests that end-stressed NNs manifesting the relations IN, WITH, FOR and TIME are fairly syntactic-like, rather than being led to claim that all NNs are compounds, it may be that nouns as modifiers must be bare, perhaps an NP lacking a NumP and a DP[52].

2.3.5 No referentiality

The elements of a compound are claimed to be non-referential regarding anaphora inasmuch as they form anaphoric islands (Postal, 1969). Thus, neither element may act as an antecedent for a pronoun, whereas this is possible in syntactic constructions. It is additionally possible for reference within an AP (44a).

(44) a. *With my 'sun$_i$ glasses, I am protected from it$_i$ well.

cf. My glasses for a bright sun$_i$ protect me from it$_i$ well.

b. *With the 'mother ship$_i$ nearby, all others$_i$ come home safely.

cf. My mother's ship$_i$ and all others$_i$ come home safe.

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[51] I have not included examples of 'material' given that the modifiers are usually non-count nouns.

[52] See Lieber (1992) who suggests a similar analysis and also the discussion in Sadler & Arnold (1994: 189).

c.   *The 'house$_i$ wife next door always cleans it$_i$ on time.

cf. The wife who cleans her house$_i$ always cleans it$_i$ on time.

d.   * With my 'tooth$_i$ brush, they$_i$ come out very clean.

cf. With the brush for my teeth$_i$, they$_i$ come out very clean.

However, anaphoric reference is possible in some attested compound words, even with fore-stress. The examples cited in the literature typically refer to famous people, but not only:

(45)   a.   ['Chomsky$_i$ supporters] think he$_i$ is brilliant. (Sadock (1998: 164))

b.   I was reading this [Peggy 'Noonan$_i$ book] on her$_i$ years at the White House...[53]

c.   Bill$_i$ tried to seek [self$_i$-ful'filment]. (Sadock (1998: 164))

Somewhat surprisingly, anaphoric reference is even possible within a derived word:

(46)   a.   Those Lennon$_i$-ish glasses do not do him$_i$ justice

b.   Colombian$_i$ law dictates that its$_i$ citizens must...

c.   ... what sharply distinguishes [Chomskyan$_i$ 'practice] from that of his$_i$ structural forbearers... (Bauer (1998b: 72[54]))

Citing these kind of examples, numerous authors[55] have claimed that anaphoric islandhood is irrelevant in distinguishing between morphological and syntactic constructions. Given the evidence, I would tend to agree that on its own, the 'no-anaphora' criterion does not uniquely identify a lexical construction. However, (45) may be acceptable because syntax is able to identify an independent lexeme, even within certain derived words, here adjectives, similar to the line of reasoning taken above (with coordination and *One*-substitution). Specifically, the affixes in (45), i.e., *-(i)an* and *–ish* are extremely productive and could be considered morphologically transparent. Other independent lexemes in derived words are not as easily identified in anaphora:

[53] Liberman and Sproat (1992: 173)
[54] Who cites N.Vincent, Zero in Asher (1994: 5082)
[55] See among others Liberman and Sproat (1992), Bauer (1998b), Lieber (1992) and discussion in Sproat (1992: 254) and references cited there.

(47) a.   *The home$_i$less do not have one$_i$.

      b.   *When we think of cannibal$_i$ism we do not think of him$_i$/her$_i$ as being civilised.

While the discussion of transparent and opaque morphological affixes is beyond the scope of this dissertation, there does seem to be some evidence which suggests that lexical items display degrees of anaphoric islandhood according to the degree of lexicalisation. Indeed, the data in (44) highlights the contrasts between true phrases and semantically opaque, semantically specialised NNs regarding this criterion. Additionally, anaphoric reference is acceptable within what have so far been argued to be syntactic-like NNs, vis-à-vis the lexical NNs in (44) above, reiterated in (49):

(48) a.   From the Oxford$_i$ 'high school we can visit its$_i$ main street easily.

      b.   Near the kitchen$_i$ 'sink is its$_i$ door.

      c.   With my reading$_i$ 'glasses I can do it$_i$ better.

      d.   The gas 'cooker$_i$ consumes a lot of it$_i$.

(49) a.   *With my 'sun$_i$ glasses, I am protected from it$_i$ well.

      b.   *With the 'mother ship$_i$ nearby, all others$_i$ come home safely.

      c.   *The 'house$_i$ wife next door always cleans it$_i$ on time.

      d.   * With my 'tooth$_i$ brush, they$_i$ come out very clean.

2.4 A note on productivity

NN compounding in English, as a component of morphology, is claimed to be highly productive and recursive[56], sharing this characteristic with syntax. The concept of 'productivity' is used in a variety of senses, a strict definition being hard to come by (see Bauer 2001b: 1ff.). For the present purposes, a general meaning of productivity can be embodied by Hockett's (1958: 307 in Bauer, 2001b: 2) observation that 'the productivity of any pattern – derivational, inflectional or syntactical – is the relative freedom with which speakers coin new grammatical forms by it'.

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[56] See, among others, Selkirk (1982), Lieber (1983), Cinque (1993) and Plag, Braun & Lappe (2007).

Thus, productivity is not at all unique to syntax. We can create new forms from already existing words such as *sugariness* and *wonderfulness*, or, if told the syntactic category of nonce forms such as *gloid*$_V$ and *vairth*$_A$ we need no other information in order to use them as derivatives, e.g., *gloidation*, *gloidingly*, *vairthly* and *unvairth*. In addition, as is well documented, we will be able to pluralise or conjugate a nonce form: young children know that the plural of *wug* is *wugs* (Berko, 1958) and in taking the above *gloid* as a verb, we can easily come up with *I gloid*, *you gloid*, *she/he/it gloids* or *we are gloiding*, *they gloided* and *tomorrow I will gloid*.

'Productivity' as a criterion for distinguishing a compound from a phrase is therefore not entirely useful. However, where syntactic constructions are always productive, this is not true for lexical items. As was noted earlier, many lexical NNs manifest a relation between the two elements that is fairly unique to that particular construction, for example, *mother ship* or *housewife*. Regarding productivity, the process involved in forming these constructions may no longer be a productive one (see in particular, Bauer: 2001b).

On the other hand, the construction itself, having initially been formed productively, may have simply become lexicalised over time, acquiring a fixed, semantically specific meaning. For example, the original rule of combination for *housewife* may in fact be OF, widely present among NNs (whether lexical or phrasal is not directly relevant here), 'a wife OF the house', whereby over time the meaning acquired various connotations. Alternatively morphology may allow the construction of non-productive semantically opaque NNs. Whatever the origins of such NNs may be, it is clear that in our current lexical vocabulary, these constructions are lexical items, that is, are listed in the lexicon with a fixed meaning.

However, despite their lack of productivity, items listed in the lexicon which are opaque, semantically specialised or idiomatic, can form the basis for potential nonce forms based on analogy. For example, we could imagine the *mother ship* being the controlling vessel from one point in the sea, and a *fathership* another vessel at a different location, with the same role. Similarly, it is not uncommon to hear of a man who has the role of housewife being

referred to as *househusband*. As was mentioned in (§2.2.1), analogy is a plausible morphological process, and thus, even the most lexical of NNs display some degree of productivity.

Regarding recursiveness, as is well documented, NN stacking is popular in English, often producing incredibly long strings of nouns:

(50) a. *vehicle control standards enforcement problems*

      b. *moon exploration project soil molecule analysis equipment failure*[57]

      c. *news rack ordinance compliance violation warning and fixture*

        impoundment notice[58]

Given the burden on our processing system, it is unlikely that any of (50) are listed. The question is more relevantly whether they are constructed in syntax or in morphology. We are clearly creating one concept that lacks any overt syntactic structure, however it is also reasonable to point out that this recursive property of NN constructions suggest a productive process similar to syntax. In any of the examples in (50) there is understood (perhaps deleted) syntactic material, evidenced by the possibility of mixing prepositional phrases with bare NNs:

(51) a. *problems* with *enforcement* of *standards* of *vehicle control*

      b. *enforcement problems* with *standards* of *vehicle control*

      c. *problems* with *vehicle control standards enforcement*

There is to some extent recursivity in morphology, illustrated by the possibility of multiple derivation, seen earlier in (5d):

(52) $_N$[anti- dis- $_V$<u>establish</u> -ment -ari -an -ism]   *antidisestablishmentarianism*

Claiming syntactic status based on recursiveness therefore poses the very same problem

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[57] Examples (a-b) are taken from Levi (1978: 67), although in a slightly modified version. Levi assumes that relational adjectives are the same as nouns, thus her examples could not strictly exemplify NN-stacking. I have substituted her relational adjectives in these examples with their corresponding noun. That is: *vehicle* for *vehicular*; *moon* for *lunar*; *molecule* for *molecular*. The reader will preliminarily note that in doing so, the overall sense of the example does not change. This concept will be discussed further in the next chapter.
[58] http://itre.cis.upenn.edu/~myl/languagelog/archives/002296.html

that has been discussed in previous sections of this chapter regarding compounds in general: there is a need to define which rules of combination are available to morphology, and which are available to syntax.

3. Some preliminary conclusions regarding the compound/phrase divide

3.1 Stress

Fore-stress is only available in the lexicon. It may be found in:

(54)   a.   classifying constructions:

  'olive oil, *'Griffins biscuits*, *'manuscripts room*

  b.   semantically opaque constructions:

  'mother ship, *'housewife*, *'buttercup*

  c.   semantically transparent (originally syntactic) NNs which show some degree of semantic specialisation through lexicalisation. (Alternatively, some could in actual fact belong to group (54a)):

  'handtowel, *'mountain hut*, *toothbrush*

End-stressed NNs are semantically transparent, lack semantic specialisation and are generally visible to syntactic processes. End-stress is therefore considered to be assigned in syntax, and possibly in a more limited way within morphology exclusively through analogy. Any lexicalised or listed end-stressed NNs are not semantically specialised.

3.2 Semantic transparency/opacity and semantic specialisation

A construction is semantically opaque if its interpretation is not discernible from the meanings of either of its constituents and the relation that binds them. Any syntactic construction will have a transparent relation. However, defining a transparent relation requires understanding which relations are predicted by syntax and which are only available through encyclopaedic knowledge associated with the constituents or the NN as a whole. In other words, while many relations that exist between the elements in syntactic NNs appear to be prepositional adpositions found in syntax, there is nothing which theoretically precludes morphology from being able to form words that express the same relation, other than the general desire to conform to Occam's razor, especially given that the interpretation

of many lexical NNs is often based around a preposition (e.g., *toothpaste* 'for'; *desert rat* 'in/from'; *tax law* 'about' etc.). What is relevant here is whether these lexical NNs were constructed in morphology, or whether they are lexicalised syntactic constructions.

Drawing from the discussion in this chapter, syntactic constituent tests and an end-stress pattern suggest that the following associative and ascriptive relations are syntactic as long as the NNs are end-stressed and lack semantic specialisation:

(55) a. MADE OF – *steel 'bridge*, *plastic 'chair*

b. IN – *Oxford 'college*, *kitchen 'sink*, *mountain 'hut*

c. TIME – *winter 'holiday*, *morning 'coffee*

d. WITH – *gas 'cooker*, *steam 'radiator*

e. FOR – *cooking 'apple*, *bathroom 'towel*

Any fore-stressed NNs which manifest one of the above relations are likely to be either classifying (and constructed in morphology) or to have been semantically specialised to some degree through lexicalisation.

3.3 Syntactic criteria
The five syntactic constituency tests discussed above can be summarised as follows:

(i) Coordination alone does not identify a syntactic structure, but instead identifies an independent lexeme, regardless of whether it is part of a lexical unit or not

(ii) *One*-substitution does not identify only syntactic structures as it can also be applied positively to classifying compound NNs. It does, however, only identify semantically transparent NNs that lack semantic specialisation

(iii) It is difficult to modify any N_1 with an adjective. However it is possible in semantically transparent NNs that lack semantic specialisation (both classifying constructions and non-).

(iv) It is not possible for the N_1 in any NN, whether it is a syntactic form or a compound, to show number morphology (despite the noted apparent exceptions)

(v) Anaphoric reference is possible inside a lexical item that contains an independent lexeme, but there is some evidence that suggests the more semantically specialised or opaque a NN is, the more likely it is to be an anaphoric island.

3.4 Productivity and recursiveness

If fore-stress is indicative of a lexical construction, then true compounding is undeniably a productive process. Lack of productivity only identifies listed, semantically opaque compounds. However, it was shown that even in those cases, it is possible to form a new construction based on analogy. Recursiveness does not seem to be limited to syntax.

3.5 Summary

Throughout the discussion in this chapter, I have shown that there are many relevant criteria for providing a distinction between a phrasal NN and a true lexical compound, although, none of the individual criteria mentioned here are able to do this single-handedly. The definition of a compound proposed by Bauer ((2001) in (2), restated here in (53)), while very general, would therefore seem to accurately encapsulate the overall situation:

(53)   "[...] a lexical unit made up of two or more elements, each of which can function as a lexeme independent of the other(s) in other contexts, and which shows some phonological and/or grammatical isolation from normal syntactic usage."

However, I have shown that other than the grammatical and phonological isolation mentioned by Bauer, semantic isolation is typical in lexical NNs and that there are a number of correlations within the diagnostic criteria for the phrase/compound distinction. What was argued is that semantic specialisation and semantic opacity each correlate with fore-stress, and a general inability to undergo *One*-substitution, anaphoric reference or modification of N_1. Conversely, a lack of semantic specialisation correlates strongly with end-stress, even with respect to certain lexicalised constructions. The compound criteria is perhaps less irrelevant than was considered in the literature. However, they must be correlated with one another in order to be of any use.

The criteria, taken as a whole, therefore seem to provide a sort of continuum (see (56) below), whereby the formation of NNs can be seen to straddle syntax and morphology.

(56) ↑ **SYNTAX**

End-stress   Transparent predicates   Lack of semantic specialisation
winter 'holiday, *steel 'bridge*, *kitchen 'sink*, *cooking 'apple*, *gas 'cooker*
    All constituency tests apply[59]   **PHRASAL NNs**

End-stress   Transparent predicates   Lack of semantic specialisation
        Some lexicalisation
olive 'oil, *London 'road*, *November 'rain*, *town 'crier*, *Madison 'Avenue*, *apple 'pie*
    All constituency tests generally apply[60]   **LEXICALISED PHRASAL NNs**

Fore-stress   Transparent predicates   Lack of semantic specialisation
        Classification / naming function
'knitting machine, *'art books*, *'Griffins biscuits*, *'Madison street*, *'chocolate cake*
    Some constituency tests apply[61]   **COMPOUNDS**

Fore-stress   Transparent predicates   Some semantic specialisation
        Classification / Lexicalisation
'olive oil, *'serving spoon*, *'manuscripts room*, *'winter sports*, *'voter-anger*
    Some constituency tests may apply   **COMPOUNDS /**
        LEXICALISED PHRASAL NNs[62]

Fore-stress   Transparent predicates   Much semantic specialisation
        Lexicalisation
'toothbrush, *'sunglasses*, *'saucepan*, *'windmill*
    Constituency tests do not generally apply[63]
        LEXICALISED PHRASAL NNs

Fore-stress   Opaque predicates   Semantic specialisation
'mother ship, *'housewife*, *'buttercup* (and other exocentric compounds)
    Constituency tests do not generally apply[64]
        COMPOUNDS
↓ **LEXICON**

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[59] Except number morphology (cf. §2.3.4)

[60] Ibid.

[61] Modification of the non-head constituent is difficult.

[62] The original construction site of these examples is difficult to ascertain, as many classifying NNs manifest a transparent predicate shown elsewhere to be syntactic. The difference would seemingly be one of a naming (classification) vs. a descriptive function as discussed in §2.2.1. However, I leave the question open here.

[63] Coordination is possible if a syntactic reanalysis is forced, and notably only when the modifier is distant from the N° (see §2.3.1, (28)).

[64] Ibid.

On the syntax end there are configurations available which produce end-stressed NNs (or stacked NNs) which lack semantic specialisation, while in the lexicon we have listed fore-stressed semantically specialised NNs, either semantically opaque or semantically transparent. Somewhere in the middle are classifying constructions which may or may not be semantically specialised and generally allow *One*-substitution (if they lack semantic specialisation), but which consistently take fore-stress.

Consequently, without precisely defining a compound, we can perhaps modify the terminology. On one end of the continuum, we have *phrasal NNs*: constructions originating in syntax which have not been lexicalised. Any phrasal NN which has been lexicalised can show varying degrees of semantic specialisation. However, following Bauer (2001b), such constructions remain examples of the structure they were before lexicalisation, i.e., are technically still phrases. This implies that we will find them in different positions on the continuum according to the degree of semantic specialisation manifested by the individual constructions. The term (*nominal*) *compound* could therefore be restricted to NNs which are simply not syntactic in origin. This would cover classifying constructions (inasmuch as they are generally assigned fore-stress, with the exception of 'names' discussed in §2.2.2) and any construction with an opaque predicate that requires (extensive) encyclopaedic knowledge in order to obtain its interpretation.

There are certainly some further questions to address within my overall observations. Nonetheless, in light of my aims, based on the evidence presented in this chapter I will assume that in order for a construction to be most syntactic-like it must be all of end-stressed, transparent and non-semantically specialised. Indeed, further support for the syntactic status of such constructions will be provided in chapter 5.

Leaving aside the 'morphology or syntax' debate, the next chapter will discuss an adjective-noun construction which behaves atypically as if it were a NN, namely, those nominals whose modifier is a relational adjective.

Chapter Two: *Relational and nominal modifiers*

1. Introduction: a unique group of adjectives

Adjectives as an overall class typically display some or all of a group of characteristics, including (but not limited to[1]) the possibility of predication, gradability, intersectiveness and an ascriptive nature. An adjective in English which manifests all four of the above, for example *beautiful*, can be used predicatively (*this house is beautiful*), can be graded on a scale of the degree of 'A°-ness' (*this is a very beautiful house/this house is quite beautiful*), intersects with the N° so that a *beautiful house* belongs to both the definable set of houses and the definable set of *beautiful* entities[2], and finally, denotes a 'property' of the house rather than an entity associated with it, i.e., ascription (cf. association).

Unsurprisingly, there are adjectives which fail to manifest one or more of the above qualities. For example, *mock* and *former* may not be used predicatively (**the president was former/mock*) and are not gradable (**a very mock/former president*); *expensive* and *tall* are not intersective inasmuch as an expensive elastic band cannot belong to a set of all things expensive, especially not in comparison to an expensive car, just as a tall ant and a tall building cannot be categorised under any definable group of tall entities.

One particular group of what would appear to morphologically be adjectives, on the other hand stand out as being consistently atypical inasmuch as not only are they all of ungradable, non-predicative and non-intersective, they are specifically not ascriptive, rather being associative. They are the so-called 'relational adjectives', a term which appears to have been introduced by Bally (1944[3]) in French descriptive grammar[4], prototypes of which are adjectives in English which appear to be derived from base nouns that take suffixes such as *–al* and *–ic* for example, *dental*, *musical*,

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[1] See Ferris (1993), Dixon (1982) and Payne & Huddleston (2002), among others.

[2] Certain instances of intersective adjectives such as *beautiful* may in some cases actually be non-intersective, for example *Olga is a beautiful dancer* is ambiguous between the interpretation whereby Olga is a dancer and she is beautiful, and where Olga dances beautifully. A detailed account of typical and atypical adjectival characteristics is not entirely relevant to the scope of my dissertation. See Cinque (2010) and references cited there for a deeper analysis.

[3] See McNally and Boleda (2004: 181)

[4] Or 'nonpredicative adjectives' (Levi, 1978), or, 'associative adjectives' (Giegerich 2004; 2005; 2006) or I will adopt the term 'relational adjectives', and reserve 'associative' for the general 'association' relation (vis-à-vis ascription) that exists between elements of what we are soon to call complex nominals: NNs and RelANs as one category.

anthropological, *maternal*, *atomic*, *oceanic*, *acoustic*, *linguistic*. Relational adjectives are not however limited to these suffixes and additionally include a number of individual forms (often but not necessarily of Latin origin) which substitute the noun to which they refer: *urban* (cf. *city*), *marine* (cf. *sea*), *corporate* (cf. *business*) etc.

The unique behaviour of relational adjectives has been pointed out for a number of languages (for example Bolinger (1967), Levi (1978), Postal (1972) and Beard (1991), among others, for English, Townsend (1975) and Mezhevic (2002) for Russian, Bosque and Picallo (1996), Fábregas (2007) and McNally and Boleda (2004) for Spanish). In particular, they are often likened to nouns due to their 'argumental nature' (see Kayne (1981) for English; Giorgi and Longobardi (1991) for Italian[5]).

If, as some claim (in particular Levi (1978), Fábregas (2007)), relational adjectives are underlyingly nouns, then a structure composed of a modifying relational adjective and an N° ((henceforth, RelANs) such as *atomic bomb*) could feasibly be considered, underlyingly, a NN (*atom bomb*). What follows is a brief outline of some of the particular characteristics of relational adjectives, which have led many linguists to believe that they are to most effects 'nouns disguised as adjectives'[6]. Section 3 will briefly discuss RelANs with respect to the compound criteria proposed for NNs, supporting their equal treatment in any discussion on the nature of compounds. Specifically, we will conclude that where a RelAN is most syntactic-like, its NN counterpart generally shows the same syntactic-like behaviour. Finally, in section 4, a tentative structural explanation for the parallel behaviour of relational adjectives and nouns will be proposed.

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[5] Given that only nouns can be arguments. See in particular Baker (2003: 142ff.).

[6] Taken mostly from Levi (1978: 2-4; 15-38), who bases her arguments on evidence put forward by Postal ((1972) in Levi (1978: 19)). Note that I have chosen to outline only five of the arguments put forward by her for descriptive purposes.

2. Nominal origins of relational adjectives[7]

2.1 Non-predicative

Relational adjectives are generally not possible in predicative position:

(1)   a.   *My appointment this afternoon is dental.

        b.   *Her instinct is maternal.

        c.   *That life is marine.

Similarly, nouns must not occur in predicate position either, and instead require maximal structure:

(2)   a.   Her teacher is *(a) woman.

        b.   The controversy was *(the) music.

        c.   Our focus in the meeting today was *(the) economy.

Two noted exceptions are what we could refer to as 'study topics' such as *my favourite subject is history*, *our assignment topic is 'World War Two*, and 'material' nouns: *the table is metal*, *our deckchairs are plastic*. However, material nouns (as was discussed in chapter 1) are seemingly syntactic (hosted in spec, MaterialP – see Scott (2002)) given their ascriptive function and topics may in actual fact have DP structure of their own, as is suggested by a count noun's inability to be singular (3):

(3)   a.   My favourite subject is mathematic*(s).

        b.   My brother's assignment was aesthetic*(s).

Furthermore, Levi (1978: 260ff.) points out that some examples, such as (3) may appear in predicative position. However, as she also shows, the sentence is much more acceptable in the context of comparison[8]:

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[7] The literature has shown that RelAN constructions are not a homogenous group (see in particular Bolinger (1967), Bosque & Picallo (1996) and Giegerich (2005). One such example, RelANs that consist of a deverbal N° *presidential decision* are treated differently from those that have a simple noun as N°, such as *presidential airplane*. However, the differing behaviours are not directly pertinent to the discussion in this section, and become more of an issue when considering the semantic predicate that holds between the N° and modifier, an argument which will be detailed in section 3 below and again in following chapters (Chs.3, 5). For now, I will refer directly to Levi (1978) who uses both types of constructions interspersingly.

[8] Additional occurrences of relational adjectives in predicate position at first glance appear to be counter examples, for example *the song is (very) musical*, *my mother is (so) critical of the system*, *my ex-boyfriend was (too) corporate*. However, the interpretation is not strictly relational: the relational adjective seems to actually have taken on a qualitative, gradable meaning. This is confirmed by the

(4)   a.   ?Our firm's engineers are all mechanical.

       b.   ?These clothes are urban.

(5)   a.   Our firm's engineers are all mechanical, not chemical.

       b.   These clothes are urban, not 'street wear'.

Here it would seem that the RelAN has undergone ellipsis, a process supposedly permitted only within syntactic constructions (Bell, 2005: 19). The data in (4-5), however, are all classifying constructions, comparable to the examples given in the previous chapter such as *Griffins biscuits*, *art books* etc., which allow *One*-substitution and are not particularly semantically specialised but do, importantly, have fore-stress. As was observed for *One*-substitution in chapter 1 (§2.3.2), the comparative context makes it possible for any class of N° to be compared to another class of N° (provided the semantic domain is similar, cf. Ch.1: fn.43), and so it may not be that these non-predicative adjectives are exceptionally predicative. Moreover, the meaning of *urban* or of *mechanical* in (4) and (5) is far from their relational meaning of 'relating to the city' and 'relating to mechanics': predicatively, they act as pure classifiers. It therefore seems reasonable to conclude, that, as Levi claimed, relational adjectives are in general non predicative. This of course is not unique to relational adjectives (see *former*, *main*, *future*, *sole*, *veritable*, *damn* etc.), but it is a characteristic that does set them apart from many.

2.2 Non degree-ness

Nouns are not gradable as they do not inherently contain any range of degree-ness and subsequently may not be preceded by *very* or *quite* etc (6). This also holds for relational adjectives, as can be seen in (7) below.

(6)   *I have a very *tooth* appointment.

       *My brother is passionate about very *sea* life.

       *Last night there were some very *city* riots.

---

possibility of inserting an adverbial such as *very, so* and *too* in the parenthesis above. See also Mehzevich (1992) for a discussion of Russian.

(7)   *I have a very *dental* appointment.

        *My brother is passionate about very *marine* life.

        *Last night there were some very *urban* riots.

A direct consequence of adjectives that lack gradability is that they should additionally lack polarity pairs because there can be no scale of degree as indeed there is with categorical adjectives which take opposite positions on a continuum, such as *tall – short*; *dead – alive*; *hot – cold*, (Fábregas, 2007: 6). Indeed, polar opposites of nouns do not exist and negation of a relational adjective works differently to the negation of a typical adjective. Following the reasoning in Fábregas (2007: 6), where the *book* in *an unsuccessful book* cannot be deemed successful, no implication can be made regarding 'linguistic' from *a non-linguistic book* other than the topic was anything but linguistics[9].

This, again, is not unusual in that there are many non-gradable adjectives (*mere*, *former*, *married*, *false*, *male* etc.). However, their behavioural similarity with respect to a corresponding noun in the same position and context as shown in (6), does suggest that relational adjectives have an underlying nominal structure.

2.3 Co-ordination with nominal modifiers

As was mentioned in the previous chapter, conjunction of two elements is considered to be possible only in cases where the two are of the same constituent type. Consequently, if relational adjectives are true adjectives, conjunction should be possible between the two. We would additionally expect for conjunction between a noun and a relational adjective to be impossible. Instead, we find that a relational adjective may not be conjoined with another member of the category 'adjective' (8a), but may indeed be conjoined with another relational adjective (8b) or a noun (8c):

(8)   a.   **mechanical and respected engineers*

                electrical and expensive heating

                literary and interesting studies

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[9] It could be argued that the interpretation of *non-linguistic* is more one of being 'not in the style of language/linguistics'. However, in this case the adjective would be qualitative, and we are here interested in its interpretation as a relational adjective. Also see fn.8.

b. *mechanical and electrical engineers*

electrical and solar heating

literary and anthropological studies

c. *mechanical and mining engineers*

electrical and gas heating

literary and nature studies

The data in (8) strongly suggest that relational adjectives have more in common with nominal modifiers than with other adjectival modifiers. This is, however, to be expected given that qualitative and classificational adjectives may not be coordinated, either (see Ch.1: fn.43). Nonetheless, the possibility of coordinating the relational adjective with a noun strongly suggests a parallelism between the two categories.

2.4 Noun suppletion[10]

Perhaps one of the most convincing arguments is that in prenominal position a relational adjective may in most cases be substituted by the noun to which it refers with no change to the interpretation whatsoever[11] as can be seen in (9)[12]:

(9) a. *atom bomb* b. *atomic bomb*

mother role *maternal role*

industry output *industrial output*

sea[13] life *marine life*

language skills *linguistic skills*

city parks *urban parks*

One form is preferred over another usually in lexicalised constructions[14] which are established enough in our lexicon to have acquired specific connotations and semantic

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[10] See also Koshiishi (2002) for a general overview.
[11] Excluding the qualitative interpretation (fn.7)
[12] Examples taken from Levi (1978: 38)
[13] My insertion. I would argue that *marine* is derived from *sea* and not *ocean* as is actually given in Levi (1978: 38).
[14] Additionally a relational adjective must be used with agentive and possessive constructions such as in ((13a) and (13d), respectively) below: *the president refusal, *the editor comment, *woman intuition etc. We will discuss this again in chapter 5.

opacity, thus making the other form sound 'odd', in some cases, even ungrammatical[15]:

(10) a. *spring cabbage* b. *??vernal cabbage*

  ?spring equinox *vernal equinox*

  kidney damage *?renal damage*

  *nerve system *nervous system*

  cat food *??feline food*

  *globe warming global warming

  ?clerk work clerical work

Naturally, this is not a bilateral observation as not all nouns may be substituted by relational adjectives given that a relational adjective does not exist for every noun. We could, however, stretch the imagination and fabricate relational adjectives derived from common nouns for which there is no adjectival counterpart[16]:

(11) a. *nut loaf* b. *"nutten" loaf*

  lace handkerchief *"lace"' handkerchief*

  family antiques *"familial" antiques*

  summer vacation *"summeral" vacation*

  vapour lock *"vaporic" lock*

  pine cone *"pinic" cone*

Thus it would seem that. in English, bare nouns are acceptable modifiers of other nouns simply because the language lacks the morphological richness of relational adjectival derivation. Furthermore, this observation seems to be borne out in other languages, such as Italian, which does not have the possibility of bare noun compounding, and which boasts a much greater array of relational adjectives. If the adjective exists, substitution with the alternative noun form (in Italian with the preposition *di* 'of' +

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[15] Ungrammatical forms which emerge within the NN constructions (at least in the examples I have given) could be due to a complement-head interpretation of the NN also being available providing interference. I.e., a *nerve system* could be any system of nerves – perhaps if a computer had pieces called 'nerves', their interaction could be a *nerve system*; *globe warming* could refer to the warming of the globe (the earth) by some outside force such as a super-galactic radiator. For further discussion on what Bauer (2001: 492) refers to as mis-matches, see in particular Levi (1978) and Giegerich (2005).

[16] Following Giegerich (2004: 11). However, see the same author (p10) who points out this is not possible for complement-head constructions, which, as stated earlier (Ch.1: fns.10, 22), will not be an integral topic in the present dissertation. A relational adjective is seemingly restricted to the 'associated with' relation expressed in relation to the N°.

noun) is less natural than in English[17], as can be seen by the impossibility of many of the translations for (9) in the (a) examples below[18]:

(12) a. *bomba di atomi*   b. *bomba atomica*

      ruolo di madre   *ruolo materno*

      **produzione di industria*   *produzione industriale*

      ?vita di mare   *vita marina*

      ??abilità di lingua   *abilità linguistiche*

      ?parchi di città   *parchi urbani*

While the details of cross-linguistic morphological derivation are unfortunately beyond the scope of the present work, if this stipulation were to be proven correct, we would have a very strong basis for claiming that, at least in English, due to the lack of noun→adjective derivation, NN-compounding effectively does the same job and relational adjectives and nouns can therefore be treated as one and the same.

Consequently, if we treat relational adjectives as being interchangeable with their corresponding noun constituent within prenominal modification of an N° in English, we would expect to be able to find or create N-relA-N constructions, which seems to be the case (Payne & Huddleston (2002: 451)) given examples such as *London theological college*, *plastic musical clock*, *laboratory microscopic analysis* etc[19].

2.5 Case relations

Nouns, or noun phrases, are traditionally considered to be the only constituents that may be assigned case relations. Interestingly, Levi (1978: 27ff.) gives numerous instances of RelANs expressing thematic relations such as 'agent', 'object', 'location', 'goal/possessor', and 'instrumental'.

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[17] The differences between Italian and English are clearly much more complicated; in fact, it must be pointed out here that while the English *urban parks* and *marine life* are parks IN the city, and the life IN the sea, respectively, the Italian compound form typically (but not exclusively) takes 'di', or 'of' (*parchi di citta'*), where the locative relation is lost, becoming one more of possession as is shown in (12) below. However, the relevant point here is the observation that if a relational adjective exists, it is used, whereas if one does not exist, a noun takes its place. It does generally not happen the other way around.

[18] It could be that the (b) examples of RelANs I give here are more lexicalised in Italian than they are in English. However, if this were the only cause, in any case we would expect a number of situations where the N-*di*-N structure is lexicalised. In actual fact it seems that there are simply far more relational adjectives in Italian than in English, precluding the use of the alternative N-*di*-N construction.

[19] It could be claimed that the A forms a compound with the N°, subsequently compounding again with the N₁, so that the structure would be [N[Atheological-Ncollege]].

(13)   a.   *presidential refusal*   Agent

              editorial comment

              senatorial investigations

       b.   *cardiac massage*   Object

              oceanic studies

              dramatic criticism

       c.   *marginal note*   Location

              marine life

              urban transit

       d.   *occupational hazard*   Goal/Possessor

              feminine intuition

              planetary mass

       e.   *manual labour*   Instrument

              solar generator

              microscopic analysis

Rather than claim that adjectives can be assigned case, it would be reasonable to assume that prenominal relational adjectives can specifically express thematic relations precisely because they are, underlyingly, nouns.

2.6 Summary

Among the five arguments for relational adjectives to be treated as nouns presented above, the two most convincing are 1) that nouns and relational adjectives are interchangeable as nominal modifiers (§2.4) and 2) that both RelANs and NNs express thematic relations (§2.5). Indeed, while other adjectives may also be non-predicative, or non-gradable, and can be coordinated only within certain domains, the interspersibility of relational adjectives with nouns in positions assigned some thematic role is an important observation that will prove to be crucial in my analysis here.

Having argued for the equal treatment of relational adjectives and nouns as nominal modifiers, the next logical issue is whether to call this form an N or an A. This will be dealt with in section 4. The next section will first discuss RelANs and NNs with regards to the conclusions on the compound criteria reached in chapter 1.

3. RelANs are NNs: the compound criteria

With our analysis of a relational adjective as a 'noun in disguise', it goes to say that RelANs should behave the same way as their respective NNs with regards to the compound criteria. Given that my focus in this work is on investigating the syntax as a possible construction site for nominal constructions, I will not discuss RelANs which show grammatical, phonological or semantic isolation. This section therefore provide examples of RelANs and their NN counterparts where both groups of constructions show syntactic-like qualities.

The NNs in (14) are all end-stressed and lack semantic specialisation as are their RelAN counterparts.

(14) a. *wood 'table*   *wooden 'table*   (MADE OF)
      b. *ocean 'rock*   *oceanic 'rock*   (IN)
      c. *autumn 'rains*   *autumnal 'rains*   (TIME)
      d. *bird 'sanctuary*   *avian 'sanctuary*   (FOR)

In addition, both sets of examples can undergo coordination of either the first or the second element, where the relational adjective may in fact be conjoined with another noun (cf. §2.3 above):

(15) a. (i)   *steel and wood 'table*   *steel and wooden 'table*
          (ii) *wood 'table and 'chair*   *wooden 'table and 'chair*
      b. (i)   *mountain and ocean 'rock*   *mountain and oceanic 'rock*
          (ii) *ocean 'rock and 'sea-bed*   *oceanic 'rock and 'sea-bed*
      c. (i)   *winter and autumn 'rains*   *winter and autumnal 'rains*
          (ii) *autumn 'rains and 'floods*   *autumnal 'rains and 'floods*
      d. (i)   *flower and bird 'sanctuary*   *flower and avian 'sanctuary*
          (ii) *bird 'sanctuary and 'shrine*   *avian 'sanctuary and 'shrine*

Furthermore, *One*-substitution is possible:

(16) a. *the steel table and the wood one*
              cf.   *the steel table and the wooden one*
      b. *the winter rains and the autumn ones*
              cf.   *the winter rains and the autumnal ones*

c.   *the flower sanctuary and the bird one*

cf.   *the flower sanctuary and the avian one*

Surprisingly, anaphoric reference is not allowed between pronouns and relational adjectives:

(17)   a.   Looking at the wood$_i$ 'table I can see that it$_i$ was treated

cf.   *Looking at the wooden$_i$ 'table I can see that it$_i$ was treated.

b.   From the ocean$_i$ 'rock we can gauge how deep it$_i$ is.

cf.   *From the oceanic$_i$ 'rock we can gauge how deep it$_i$ is.

c.   Last year's incessant autumn$_i$ 'rains proved that it$_i$ was a wet one$_i$.

cf. *Last year's incessant autumnal$_i$ 'rains proved that it$_i$ was a wet one$_i$

d.   At the bird$_i$ 'sanctuary, I hear them$_i$ chirping all around.

cf.   *At the avian$_i$ 'sanctuary, I hear them$_i$ chirping all around.

The data in (17) considerably weaken the claims made by Levi (1978), given that if a relational adjective were a noun in disguise we would expect it to be able to act as the antecedent of a pronoun, especially as this was in fact the case in the previous chapter (§2.3.5: (46), reiterated here as (18)) for certain 'referential' relational adjectives[20] – relational adjectives which refer to proper nouns[21] (such as *French* or *presidential* etc.).

(18)   a.   Colombian$_i$ law dictates that its$_i$ citizens must...

b.   ... what sharply distinguishes [Chomskyan$_i$ 'practice] from that of his$_i$ structural forbearers...

Notably, however, the relational adjectives are not interchangeable with their noun counterparts: **Colombia law*, **Chomsky practice* suggesting that they have different qualities to the relational adjectives discussed above.

Upon closer investigation of these referential adjectives we additionally see that anaphoric reference is allowed inside the relational adjective exclusively when it

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[20] Kayne (1981) and Giorgi & Longobardi (1991), among others. We will further discuss this particular set of relational adjectives in chapter 5 (§3.9).

[21] Perhaps not true for well known people, maintaining end-stress: ?*Kennedy murder*, ?*Chomsky visit* vis-à-vis *Kennedyian murder*, *Chomskyan visit* where both seem to be acceptable.

occupies a subcategorised thematic position of a verb from which the N° is derived[22], or of a noun which can be thought of as having some argument structure[23] ((19) and (20)) vis-à-vis (21). Surprisingly, it is even allowed within the adjectival suppletive form of its noun counterpart ((19a) and (20a)). The use of a nominal modifier which expresses the 'theme' or the 'agent'[24] leads to ungrammaticality (as was the case for (18) above), but is instead possible as the non-head element of a semantic relation paraphrased by the preposition IN[25] similar to those in (17) above.

(19) a.   Dutch$_i$ tourism gives its$_i$ citizens a headache.   'theme'

      b.   *Holland$_i$ tourism gives its$_i$ citizens a headache.   'theme'

      c.   Chomskyan$_i$ criticism does not affect his$_i$ work.   'theme'

      d.   *Chomsky$_i$ criticism does not affect his$_i$ work..   'theme'

(20) a.   Dutch$_i$ whale fishing affects its$_i$ economy.   'agent'

      b.   *Holland$_i$ whale fishing affects its$_i$ economy.   'agent'

      c.   The Presidential$_i$ debate made him$_i$ look bad.   'agent'

      d.   *The President$_i$ debate made him$_i$ look bad.   'agent'

(21) a.   *The Dutch$_i$ canals make it$_i$ such a pretty city.   IN

      b.   The Holland$_i$ canals make it$_i$ such a pretty city.   IN

      c.   *The Colombian$_i$ earthquakes make it$_i$ an unsafe country.   IN

      d.   The Colombia$_i$ earthquakes make it$_i$ an unsafe country.   IN

Aside from the data in (17) – (21), there is a wealth of evidence for treating RelANs and NNs as having the one unique underlying structure. It therefore seems advantageous not to presume that they have entirely different structures but that there is perhaps some syntactic structural difference solely regarding anaphora. Thus, it seems that relational adjectives (excluding the referential adjectives in (18) – (20)) form an anaphoric island,

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[22] For independent reasons the deverbal noun cannot be an event denoting nominal: *the Dutch invasion greatly affected its citizens. See Ch.5: §3.9 for further discussion.
[23] See Liberman & Sproat (1992: 140).
[24] We could paraphrase the relations expressed by the relational adjective in (19) as 'about' and in (20) as 'source'. See Ch.3: §3 for further discussion.
[25] A referential adjective is not possible as the modifier in constructions which express the relations FOR or WITH (*the presidential concert (FOR/WITH)) or TIME/MADE OF, these latter two for the obvious semantic reasons. Indeed, the only relations in which they are possible seem to be 'agent', 'theme' and IN.

whereby their nominal counterparts are not. We will consider the hypothesis about anaphoric islands again in chapter 4 in light of the theoretical paradigm to be proposed. For now, based on the parallels between relational adjectives and nouns exemplified in previous sections, in section 4 below I will propose a preliminary internal structure.

Following Levi, I will henceforth adopt the term *complex nominals* when referring to the general category that includes structures composed of a relational adjective + noun (RelANs)[26] or noun + noun (NNs): "*The term complex nominal thus refers to that syntactic construction dominated by an N node and composed (in its simplest form) of a head noun preceded by a modifier which is either another noun or a nominal adjective*." (pp.38-39).

4. Internal structure

As is evident from the above discussion, most of the observations made here indicate that relational adjectives seem to be noun-like, rather than claiming the contrary, i.e., nominal modifiers are adjectival-like.

In fact, Levi's transformational analysis (1978) clearly argues that relational adjectives are derived from underlying nominal nodes, to which a late rule is applied changing the noun to its adjectival counterpart at the surface. In this way, the relational adjective behaves in every way as if it were a noun, despite overtly being an adjective. According to Fábregas (2007) this would be an instance of Transposition: "*a lexeme whose grammatical label has been changed without altering the rest of its properties*" (p.9).

It is not my intention to diminish the importance of Levi's seminal work, but it must be noted that her analysis is an early transformational one, that came to light pre-X'-bar theory. Despite the great differences between transformational studies in the 70s and the generative grammar framework to have been developed in the following 30 years, I do not wish to discard her observations. On the contrary, we may consider the hypothesis that relational adjectives are nouns in disguise as a just starting point, and attempt to deal with it within a more recent approach.

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[26] Excluding the evidently descriptive, qualitative use of relational adjectives – 'Her voice is very musical' etc. See above (fn.8).

One such recent attempt at theoretically explaining the parallels between relational adjectives and nominal modifiers is in fact Fábregas (2007) who draws from Distributed Morphology (Halle & Marantz, 1993; 1994) and from the Minimalist Program (Chomsky (1995) and much work to have followed) and proposes a configurational analysis which is able to capture the idea behind transposition, without needing to stipulate transformational rules. Summarising greatly, in Fábregas (2007) a transposition is analysed as containing in its internal structure both an *n* – the nominal base – and an adjectival suffix, *a*, the latter being unable to project its category due to a defective matrix of features; the suffix, however, is nonetheless present at spell-out.

The process is two-fold (see Fábregas, 2007: 14): Using *marginal* as an example, the first merge operation sees the noun determining its grammatical category (19a). The defective *a* is subsequently added – being unable to project its label, the resulting structure is an nP (19b)[27].

(22)
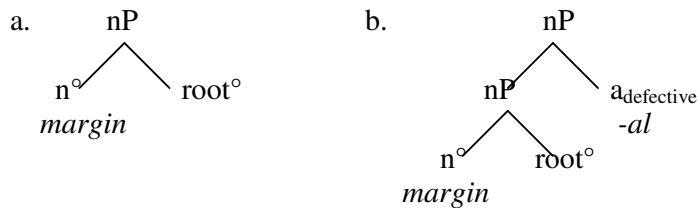
Alternatively, we could claim that the modifier in a complex nominal is in actual fact an AP headed by a Ø-suffix. In order to account for the 'noun'-like properties of relational adjectives, we might want to group them in a separate class other than 'qualitative' and 'classificational'. The NN counterparts could therefore be, as was suggested in (§2.4), the solution for the lack of derivational morphology, being used as adjectives in disguise. To illustrate, with respect to the structures proposed by Fábregas, we could posit a whole range of (non-defective) suffixes, one of which is also zero-derivation:

(23)

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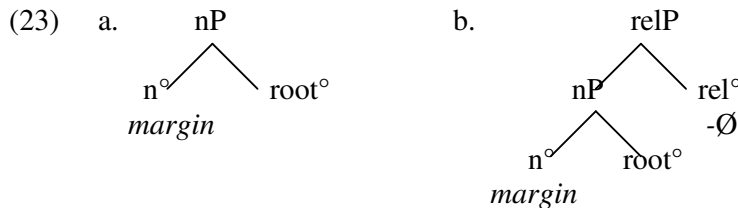
[27] The structure for the corresponding nominal modifier in English is presumably (22a).

(24)   a.   nP   b.   relP
              n°   root°   nP   rel°
             margin   n°   root°   *-al*
                                                    margin
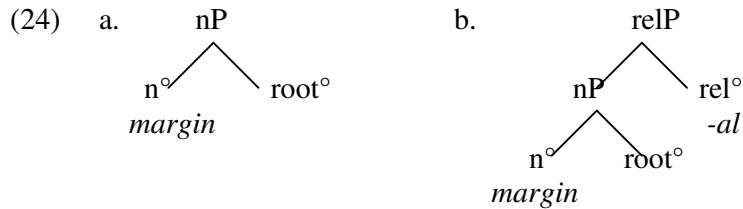
In both (23) and (24) the internal structure of the root is a noun, however the rel° is not defective as was $a_{\text{defective}}$ in (22), and always projects. Thus *margin* and *marginal* are both adjectives; however the latter manifests a true adjectival suffix while the former does not.

Perhaps if (22) were the correct structure we would be able to more readily account for why relational adjectives generally behave like nouns and not the other way around. As was mentioned above, the structural aspect of complex nominals will be further discussed in chapter 4 and for now I leave the topic open. In this chapter I merely hope to have produced some arguments regarding behaviour and distribution, as well as some structural insight, which suggest a similar treatment of relational adjectives and nouns within complex nominals.

Chapter Three: *Previous studies of complex nominals*

1. Introduction: semantic relations

In chapter one (§2.2) it was argued that many NNs manifest syntactic-like behaviour, specifically those where the relation between the modifier and N° is said to be transparent (e.g., IN, FOR, TIME, etc.). The aim of my work is to provide data which in fact supports this hypothesis. In order to do so, it will therefore be necessary to first provide an overview of the literature which has sought out a classification of complex nominals in terms of the relationship holding between the constituents and to investigate whether some insight into the potentially syntactic nature of such constructions is available. As was specified in the previous chapter, I assume along with Levi (1978) that in the domain of complex nominals the interpretation of relational adjectival modifiers (*atomic*) is equal to that of nominal modifiers (*atom*).

At first glance it would seem as if there are many differing labels assigned to the relations within complex nominals in the works I will discuss. I believe, however, that much of the work in this area has in fact come to similar conclusions and we can reduce the various labels to a smaller group of semantic relations. In other words, the same distinctions between categories have emerged, no matter which label is given.

The following discussion of background literature starts with an outline of Levi's (1978) already mentioned seminal work, which proposes a range of predicates within complex nominals (§2) while section 3 discusses a distinction between two types of relational adjectives only. An approach which appeals to logical relations within NNs will be presented in section 4, resulting in a five-way distinction, and section 5 details an analysis of purely end-stressed NNs. Finally, some conclusions will be drawn regarding which syntactic relations within complex nominals of those discussed here can be considered syntactic.

2. Levi (1978)

Levi's (1978) work is perhaps one of the most far-reaching investigations of the semantic relations between elements in complex nominals in the literature to date, and, as already mentioned, the provider of our term 'complex nominal'. She argues that the productivity in the generation of such constructions surely points towards some systematicity, without, however, denying that there are idiosyncratic aspects to the grammar of complex nominals, such as lexicalisation and individual variation in how much knowledge is associated with their interpretation[1]. Data such as (1 – 2) below show that the interpretation of complex nominals may change from construction to construction despite containing the same modifier, or the same N° (p.52):

(1) a. *musical clock*   'clock that makes music'
     b. *musical comedy*   'comedy that has music'
     c. *musical interlude*   'interlude which is music'
     d. *musical criticism*   'criticism of music'

(2) a. *electrical clock*   'clock powered by electricity'
     b. *electrical shock*   'shock caused by electricity'
     c. *electrical generator*   'generator producing electricity'
     d. *electrical heating*   'heating by means of electricity'

Levi argues that ambiguity is present in any complex nominal and that the correct interpretation is obtained simply because we have an accepted reading for each, often provided by context and encyclopaedic knowledge. For example, a *horse doctor* could potentially be ambiguous between the interpretations in (3), even though we have in some way lexicalised the construction so as to typically obtain the reading in (3a)[2].

(3) a. 'doctor for horses'   (cf. *tree doctor*)
     b. 'doctor who is a horse'   (cf. *woman doctor*)
     c. 'doctor that has horses' (cf. *peg leg doctor*)
     d. 'doctor that uses horses' (cf. *voodoo doctor*)

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[1] Notably, she excluded any metaphorically referenced, exocentric and co-ordinate constructions as none of these groups identifies the interpretation denoted by the head noun, claiming that "neither noun may be taken as head" in coordinate constructions (p.6).
[2] Examples taken from Levi (1978: 9)

In essence, Levi's work argues for the regular non-idiosyncratic production of complex nominals through one of two processes that occur between deep structure[3] and surface structure (complex nominals, were therefore considered to be formed pre-syntax, see Levi, (1978: 118ff.)[4]): (recoverable) predicate deletion and predicate nominalisation. In this way, she is able to account for the ambiguity within complex nominals due to the variety of relations available.

Her recoverably deleted predicates (RDP) are a closed set of semantic relations between the members of a complex nominal, seen to be primitive and potentially universal (p.51):

(4)

Recoverably Deleted Predicates	Complex Nominals
$CAUSE_1$ – N° 'causes' modifier	*tear gas*, *flu virus*
$CAUSE_2$ – N° is caused by modifier	*fatigue headache*, *snow blindness*
$HAVE_1$ – N° 'has' modifier	*picture book*, *pet families*
$HAVE_2$ – modifier 'has' N°	*governmental land*, *student problems*
$MAKE_1$ – N° 'makes' modifier	*music box*, *song bird*
$MAKE_2$ – N° is 'made of' modifier	*daisy chain*, *bronze statue*
USE	*steam iron*, *manual shift*
BE[5]	*lion cub*, *pine tree*
IN (including 'time')	*desert rat*, *marginal note*
FOR	*plant food*, *avian sanctuary*
FROM	*store clothes*, *olive oil*
ABOUT	*history conference*, *oil crisis*

In terms of the transformational process, she details step by step the transformations involved in the formation of complex nominals, which see the "morphological adjectivalization" – the derivation of the N° modifier into a relational adjective – being

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[3] What Levi refers to as *Logical Structure*.
[4] Furthermore, Levi made no distinction of 'nominal compound' within the group of complex nominal, having been unable to find any conclusive evidence for the identification of a compound (pp.39-48).
[5] What I referred to as IS in Ch.1: §2.1.1.

added at a very late stage. Simplifying greatly[6], the formation of *marginal note* would occur like so:

(5)   *note in margin* > *in-margin note* > (delete predicate) > *margin note* > (morphological adjectivalization) > *marginal note*

Another option available for the formation of complex nominals concerns those that have a deverbal N°, which are formed by a similar process to that outlined above for RDPs, only the predicate is already inherent in the structure.

(6)

Nominalisation Type[7]	Complex Nominals
ACT_1 – modifier is the subject of N°:	*cell division*
ACT_2 – modifier is the object of N°:	*dream analysis*
$PRODUCT_1$ – modifier is the subject of N°:	*faculty decisions*
$PRODUCT_2$ – modifier is the object of N°:	*food supplies*
AGENT (only modifier is the object of N°):	*blood donor*
PATIENT (only modifier is the subject of N°):	*college employees*

In total there are 9 RDPs and 4 types of nominalisations, although considering the passive and active variants of the nominalisations ACT and PRODUCT and the RDPs CAUSE, MAKE and HAVE, overall there are potentially 18 ways a complex nominal can acquire its interpretation. Another potential proposition, but one that Levi excludes, is LIKE, or RESEMBLES. She notes that certain complex nominals are in fact ambiguous between the intended reading (one of the RDPs or nominalisations) and a LIKE interpretation (pp.106-118). For example *feminist analyses* under the intended reading is ACT_1 where feminists analyse X, alternatively, a *feminist analysis* could be an analysis that is carried out LIKE a feminist analysis. LIKE is excluded from her list of RDPs precisely because the LIKE interpretation relies on us knowing already the basic meaning. That is, in order to be able to use *feminist analysis* in the latter sense above, we must have access to its literal meaning.

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[6] See Levi (1978: §4.2).
[7] The numeration on ACT and PRODUCT are mine to make it easier to reference during the discussion.

While this approach was able to cover a vast range of complex nominals, Levi noted that there are numerous constructions which are not accounted for within the propositions she proposes, such as *coffee/copy girl*, *vodka/shopping binge*, *milk/oil industry*, *land/air rights* etc. (see p250ff.). Furthermore, many authors have criticized her approach for being far too generalised and unable to explain the idiosyncratic information available that speakers have available in the interpretation of complex nominals[8]. For example, while *headache pills*, *fertility pills*, *bug spray* and *pet spray* all involve the relation FOR, *headache pills* are pills that make the headache disappear, but *fertility pills* increase fertility where *bug spray* is a spray that harms bugs and *pet spray* is meant to help them (as Levi herself notes, p.99). The relation is loosely FOR, but the specific interpretation relies on different types of 'purpose'. Regarding this, Levi claims that "[...] all we know for sure is that there is a relationship of intent or purpose between the head noun [...] and its prenominal modifier" (p99).

3. Bosque and Picallo (1996)

Bosque and Picallo (1996, henceforth B&P), through word order observations in Spanish, break relational adjectives into two categories: thematic and classificatory[9] (henceforth th-adjectives and c-adjectives, respectively). They briefly discuss its application in English but do not go so far as to treat English NN constructions, although it must be noted that many of their RelAN structures in Spanish are in fact translated with NNs in English, due to the attested lack of adjectival morphology in the latter.

Th-adjectives saturate the thematic role that is lexically licensed by the N°. The N° may either be a (deverbal) nominalisation, maintaining its argument structure[10], or a simple noun which has the possibility of licensing a participant, or, a thematic argument such as 'agent' (7c) as the non-head constituent (p.353).

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[8] See in particular Benczes (2006: 26-28), Stekauer (2005: 4-6) and references therein.
[9] To not be confused with the term 'classifying' used earlier. While it may be that these terms essentially refer to the same constructions, they have different connotations in the present work. Classifying NNs were shown to be lexical, fore-stressed constructions in the domain of the compound/phrase distinction. In B&P's work, classificatory adjectives are all relational adjectives that refer to associative relations within complex nominals. See below in (8).
[10] See, among others, Chomsky (1970) and Grimshaw (1990).

(7)   **Thematic**

    a.   *pesca ballenera*

        fishing whale-Ø   'whale fishing' = 'fishing of whales'

    b.   *producción automovilística*

        production automobile-Ø   'car production' = 'production of cars'

    c.   *politica americana*

        politics American   'American politics' = 'politics by America'

C-adjectives, on the other hand, do not absorb a lexically licensed theta role, but instead introduce an entity or domain that classifies the object denoted by the N° (8). We earlier referred to such constructions as "associative" (following Payne & Huddleston, 2002).

(8)   **Classificatory**

    a.   *parque jurasico*

        park   jurassic   'Jurassic Park' = 'park that contains dinosaurs[11]'

    b.   *excursión automovilística*

        tour   automobile-Ø   'car tour' = 'tour by means of a car'

    c.   *politica americana*

        politics American   'American politics' = 'politics about America'

The distinction between th-adjectives and c-adjectives is clearly demonstrated by the interpretation difference between the *automovilística* in (7b) and in (8b). Where the former is the theme of the verb 'to produce', the latter indicates that the tour is in some way related to cars. Furthermore, the construction *politica americana* is ambiguous between one reading where it is America who 'does' the politics, and another reading where who 'does' the politics is not inherent, it is politics that regards or is related to America. Other than manifesting a different relationship with respect to the N°, if both types of relational adjectives are present, B&P show that there is a strict order (pp.367-369), providing further evidence for the two distinct categories[12]:

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[11] Glosses are mine, based on English translations and based on a Levi (1978) style approach. As was pointed out in section 2 (2) these may not be the only meanings available. However, in B&P's work the precise 'relation' is not of relevance, as will be mentioned again below.

[12] For more evidence such as agreement etc, the reader is referred to the paper

(9)   a.   Spanish: *unos residuos atómicos soviéticos*

                        some residues   atomic   Soviet

        b.   English: *some Soviet atomic residues*

(10)   a.   Spanish: *una producción manual cestera*

                        a   production   manual   basket-Ø

        b.   English: *a manual basket production*

In (9) we see that the c-adjective is adjacent to the N° in Spanish, the th-adjective following. The construction in (9a) can be glossed as residues 'related to/made up of atoms' belonging to (possessor) the Soviets[13] and (10a) is a production of baskets (theme) carried out with the hands.

However, what is not mentioned in B&P is that the order in English may not always necessarily be strictly the mirror-image of Spanish (cf. B&P: 369). Where the English (9b) is th-adjective > c-adjective > N°, in (10b) the order is reversed: c-adjective > th-adjective > N°. This suggests that in English, at least, there is an ordering difference between internal arguments such as theme and external arguments such as the possessor and agent, and that at least some c-adjectives come between the two th-adjectives. This observation will be elaborated in further detail in chapters 5-6, where I ultimately disregard the order th-adj > c-adj > N° in English and conclude that neither th-adjectives nor c-adjectives (often translated into the modifying noun equivalent in English) are one homogenous group.

Many relational adjectives can be either thematic or classificatory, and are consequently ambiguous.   Thus in Spanish in a construction with two (potentially ambiguous) relational adjectives, there is one possible interpretation only; when switched, a different reading emerges. This distinction is also visible in English, at least with respect to the agent, given that the relative adjacency of the agent and a c-adjective to the N° is the mirror-image order of that in Spanish in both constructions:

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[13] According to B&P (367-368).

(11) a. *politica europea africana*   N° - C-adj – agent

       'African European politics'   agent – C-adj – N°

       'African politics about Europe'

    b. *politica africana europea*   N° - C-adj – agent

       'European African politics'   agent – C-adj – N°

       'European politics about Africa'

They also note that there are ordering restrictions within both categories (pp.366-367). The ordering of th-adjectives obeys the thematic hierarchy (pp.359-360): "*th-adjectives that absorb the theme role are closer to the head than those having a possessor or agentive role*". Their position determines whether they are interpreted as subject or object as in examples (12a and b). The impossibility of (12d) is due to the semantic impossibility of shellfish producing Galicians or Galicia, although, we could perhaps imagine this to be a possibility in the world of science fiction.

(12) a. *estudios rodoredianos femeninos*

       'studies of Rodoreda by women'

    b. *estudios femeninos rodoredianos*

       'studies of women by Rodoreda

    c. *producción marisquera gallega*

       'Galician shellfish production'

    d. **producción gallega marisquera*

       'shellfish Galician production'

For c-adjectives, they claim that the relative order follows sub-specifications where the A_1, denotes the larger class, and A_2 denotes a sub-class. In (13) below (13a) is possible, while (13b) is ungrammatical because *coma* can not be classified according to its molecular structure. On the other hand, (13c) and (13d) are both possible because *literature* can be classified according to both the country it belongs to and its chronology.

(13) a. *coma alcohólico metílico*

'methilic alcoholic coma'

b. **coma metílico alcohólico*

'alcoholic methilic coma'

c. *literatura medieval francesa*

'French medieval literature'

d. *literatura francesa medieval*

'medieval French literature'

From the data in (13), we could preliminary conclude that provided the lexical semantics of the N° allows the collocation with both, in a sequence of two c-adjectives, they would appear to be freely ordered. I will propose an alternative explanation of the apparent freedom of c-adjectives in my data analysis in chapter 5.

Unlike Levi, B&P did not set out to analyse any further these two categories. They do, however, allude to various works (such as Jackendoff (1990) and Beard (1991)) which have investigated the specific relations between the c-adjective and the N°, noting that the proposed labels come close to thematic roles, such as Locative_Path; Locative_Goal; Locative_Source; Locative_Place; Cause; Goal; Benefactive; Instrumental; Purpose, among others (B&P: 361-362). There is therefore some resemblance between B&P's c-adjectives and Levi's RDPs exemplified in (15) below. Furthermore, B&P's th-adjectives (taking the English translation) can be likened to the non-head constituent in Levi's nominalisations, which express the arguments of the N°:

(14) a. *basket production*   PRODUCT – modifier is the object of N°

b. *Soviet residues*   ACT – modifier is the subject of N°

(15)

RDP	Traditional term[14]
CAUSE	causative
HAVE	possessive/dative
MAKE	productive/constitutive/compositional
USE	instrumental
BE	essive/appositional
IN	locative (spatial or temporal)
FOR	purposive/benefactive
FROM	source/ablative
ABOUT	topic

B&P regard all RelANs as syntactic structures (p.371ff.), assigning to each relational adjective a unique XP (C-AP for classificatory adjectives and (Th-AP for thematic adjectives) which are all hosted by the maximal projection NP. The NP is layered whereby the C-AP is seen as an adjunction to the lower NP, the Th-AP being hosted by the spec of a NP higher in the structure. Finally, qualitative APs (Q-AP) are located in the spec of AgrP (B&P: 371).

(16)

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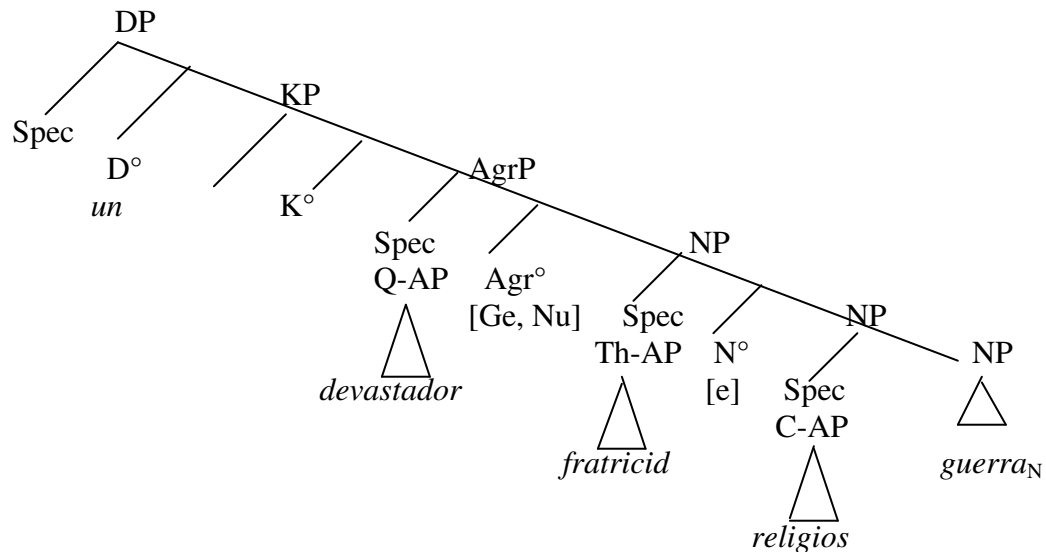
[14] Taken from Levi 1978: 77

The structure in (16) is the base structure from which a series of overt movements apply so as to obtain the surface order in Spanish (17b, B&P: 373)[15]. In English, on the other hand, no movement takes place (17a):

(17) a.   *a devastating fratricidal religious war*

      b. $[D [N_n [[C\text{-}Adj]_i \ Th\text{-}Adj]_j [Q\text{-}Adj [t_j... t_i... t_n]]]]]$

            una guerra religiosa fratricida devastadora

4. Fanselow (1981) and Olsen (2000)

In his treatment of the semantics of German NN compounds, Fanselow (1981), discussed in Olsen, (2000: 62-63) argues for a class of five logical 'basic relations' (*Grundrelationen*): 'and', 'made of', 'resembles', 'is part of', 'located at[16]'. They are relations that form the basis of our knowledge about the nature of nouns, for example, that one noun may be co-ordinated with another (conjunction), one noun can be made out of another noun (modification), etc. Similarly to the qualia structure discussed in chapter 1 (§2.1.2), these relations are independent of a noun's lexical semantics and simply refer to the domains in which a noun can be interpreted.

Olsen (2000) applies Fanselow's paradigm to English data, observing that three of the five basic relations, 'and', 'made of' and 'located at', give the meaning that we find in end-stressed compounds, while the other two, 'resembles' and 'is part of' are usually associated with fore-stress in compounds (p.61ff.):

(18) a.   'and'   *rogue 'asteroid, host-'mediator, student 'radical*

      b.   'made of'   *cotton 'blouse, glass 'window, paper 'bag*

      c.   'located at'   *winter 'term, hotel 'kitchen, world 'travel*

      d.   'is part of'   *'toenail, 'toilet seat, 'seat back*

      e.   'resembles'   *'sponge cake, 'zebra crossing, 'snowbush*

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[15] With gender and number being assigned to each adjective by [spec, AgrP] through the successive movements (B&P: 372ff.).

[16] The locative and temporal relations are merged together in this analysis.

This stress distinction leads Olsen (2000) to conclude that only the relations 'and', 'made of' and 'located at' are compound-external, or, in Fanselow's sense, independent of the noun's lexical semantics. The relations 'is part of' and 'resembles' are compound-internal, that is, one of the constituents semantically subordinates the other and the interpretation is inferred through our encyclopaedic knowledge of one of the constituents, and its lexical semantics. Olsen gives the example that part of the lexical semantics of a word such as *toe*, for example, includes the subordinate *nail* (see Olsen, 2000: 63, fn.8).

Compound-internal relations are also found in synthetic compounds, for example, *taxi driver*, *cattle breeder, brain research, baggage claim* etc., or in primary compounds such as *mucus cell* (knowing that mucus lines can line cells), or *space scientists* (knowing that scientists study)[17]. It is well-attested that synthetic compounds are almost always fore-stressed[18].

Given that I argued for fore-stress to be available strictly in the lexicon, we could effectively exclude compound-internal NNs from a potential group of syntactic complex nominals. By the same stress criterion, according to our conclusions in chapter 1, the end-stressed 'and', 'made of' and 'located at' are contrarily syntactic-like. Thus, although Olsen concludes that both compound-external and compound-internal relations are assigned in morphology, by our stress criterion the former are more likely to be syntactic. Indeed, 'made of' is to all effects our previously discussed MADE OF and 'located in' expresses the same relation as IN, both of which are shown to be syntactic in Payne & Huddleston (2002).

Olsen claims that all NNs are morphological, not syntactic (see Olsen, 2000: 64-66), arguing that there is "no apparent reason to consider [ˈtoy factory] and [toy ˈfactory] to be realisations of different underlying structures" (p.64), and that the two distinct stress patterns are available in the lexicon. Her claims diverge from the observations I made in chapter one and from the theoretical assumptions I will assume in the next chapter. It is not

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[17] See Olsen (2000: 62ff.)
[18] Ibid. See also Giegerich ((2004: 6ff.) and references cited there) among others.

my intent to implicitly argue against Olsen's arguments for a morphological account of all NN compounds, I simply wish to point out that what she claims are compound-external relations appear to correlate with syntactic-like semantic relations discussed by other authors. Furthermore, it is not clear from Olsen's paper where other relations noted in the literature would be placed within this distinction, particularly considering the variable stress pattern in many of these, for example, FOR and FROM. Thus, the only relationships we can exclude with certainty from a syntactic analysis are the two fore-stressed compound-internal relations 'is part of' and 'resembles'.

5. Liberman & Sproat (1992), revised in Bell (2005)

In their attempt to find a stress-based distinction between a phrase and a compound, Liberman & Sproat (1992, henceforth L&S) outlined a classification of NN structures. Like many others discussed earlier, they drew a division between NNs with a deverbal head whose internal argument is realised as N_1 ("synthetic" compounds) and those with an external inferred predicate where no argument structure is present (cf. "root" compounds). L&S label these argument-predicate compounds and argument-argument compounds, respectively. I will however, avoid the term 'compound', reserving it exclusively for lexical NNs.

They claim that an argument-predicate NN is an N° level constituent given that stress is assigned to the first element, i.e., fore-stress, and that argument-argument NNs with end-stress are joined at the higher level N^1. Consequently, end-stressed NNs are taken to be phrases. However, they are unable to find sufficient evidence for the construction of fore-stressed argument-predicate compounds in the lexicon. Given the aims of this work, what is of interest here is the apparently phrasal end-stressed NNs, or more, the semantic relations identified by L&S within this group. In some later work, Bell (2005) revisits the categories discussed in L&S and looks for further evidence that they are phrasal through the application of syntactic tests in much the same way as was outlined in chapter one. Here, we will discuss her observations, using the labels she assigns in her analysis. The ten groups of end-stressed NNs reported in L&S (pp.156-160) are as follows (Bell, 2005:12-13):

(19)

Semantic Relations	NNs
MADE OUT OF	*plaster 'cast*, *nylon 'rope*, *wood 'floor*
PLACE	*kitchen 'sink*, *school 'bricks*
TIME	*winter 'carnival*, *September 'mornings*
PROPER_NAME-thing	*Napolean 'brandy*, *Tiffany 'lamp*
PROPER_NAME-location	*Times 'Square*, *Strawberry 'Fields*
PROPER_NAME-institution	*Yale 'University*, *MIT 'Press*
MEASURE	*pound 'note*, *two-minute 'warning*
METHOD	*oven 'vegetables*, *propane 'torch*
Residual examples	*tray 'plate*, *teacher 'student*
CLASSIFIER_NAME – left headed	*Peach 'Melba*, *Club 'Med*

The syntactic template used by Bell is *One*-substitution:

(20)   The **N₁N₂** is/are comparative_adj   than the   **X**   one

A comparative adjective is inserted depending on the semantic context of the NNs and the X may be an adjective or a N₁. To exemplify (see Bell, 2005: 17ff.):

(21)   a.   The wood 'floor is warmer than the vinyl one.   MADE OF

        b.   The school 'bricks are more weathered than the new ones. PLACE

In her analysis, a secondary test is incorporated where she observes whether or not the constructions allow ellipsis – a typically phrasal process (p.19). Applying this to the examples in (21) we get (22):

(22)   a.   The wood 'floor is warmer than the vinyl.

        b.   The school 'bricks are more weathered than the new.

The results of these tests divide the semantic NN relations in (18) into three distinct groups: those that allow both *One*-substitution and ellipsis, those that allow *One*-substitution but not always ellipsis, and those that allow neither:

(23)

Most 'phrase-like'	Some-what 'phrase-like'	Not 'phrase-like'
MADE OUT OF MEASURE	PLACE TIME PROPER_NAME-thing METHOD	PROPER_NAME-location PROPER_NAME-Institution Left_Head-Classifier_Name

Bell concludes overall that the default status of NNs in English is lexical. However she does show that MADE OUT OF and MEASURE are likely to be phrases and that the N_1 has the function of an adjective. This can be demonstrated that through data such as (24) found on the internet which show that MADE OUT OF and MEASURE N_1 modifiers can both be modified by an adverb (all examples are taken from Bell (2005: 34-35)).

(24)   a.   "These boot were *entirely leather*"[19]

        b.   "I do hope that the amnesty doesn't turn into a *completely paper* tiger"[20]

        c.   "You get a handful of *approximately two-minute* interviews"[21]

        d.   "For instance, an *exactly three-minute* call costs 69 cents"[22]

On the other end of the scale, were the three categories in (23) which showed "no signs of phrasehood" (p.28), as exemplified in (25):

(25)   a.   *The Strawberry 'fields are nicer than the Raspberry ones.

        b.   *The Strawberry 'fields$_i$ are nicer than the Raspberry e_i.

                                     PROPER_NAME-location

        c.   *The Harvard 'College is more modern than the Durham one.

        d.   *The Harvard 'College$_i$ is more modern than the Durham e_i.

                                       PROPER_NAME-institution

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[19] ww.staffs.ac.uk/schools/engineering_and_technology/des/intranet/nzjournet/history1.html
[20] www.divernet.com/beachcomber/bcomber0200.html
[21] www.scifi.com/sfw/issue273/screen4.html
[22] www.thedigest.com/mirror/bastone.html

e.   *The Club 'Med is nicer than the sun one.

f.   *The Club 'Med$_i$ is nicer than the sun e_i .

<div align="center">Left_Head-Classifier_Name</div>

Bell stipulates that the end-stressed pattern in these constructions may depend on the degree of lexicalisation given that they are all relatively transparent. This is similar to my suggestion in chapter one that some syntactic NNs upon lexicalisation maintain their end-stress due to lack of semantic specialisation, however, given that Bell found no conclusive evidence that these constructions are in any way syntactic, I will not assume that this is necessarily the correct explanation. What is important here, is that the "not phrase-like" NNs in (23) above can be excluded from the group of potentially syntactic NNs. Additionally, I will exclude PROPER_NAME-thing from this group because of clear 'naming' function that brand names have (as per the discussion in section 3.2 of chapter one) and also given the observation made by Bell (p22) that brand names are often used on their own to represent the entire entity they refer to.

On the other hand, PLACE, TIME and METHOD are interesting. Bell's labels can be replaced by what we identified as syntactic-like NNs in chapter one 'located in', 'time' and 'with', or by Levi's classification of RDPs, IN (locative and temporal) and USE. Bell, however, shows that despite the success of *One*-substitution (26), ellipsis in these constructions is not possible unless X is an adjective (27)[23].

(26)   a.   The kitchen 'sink is deeper than the bathroom one.

        b.   The winter 'carnival is more fun than the summer one.

        c.   The oven 'vegetables are tastier than the boiled ones.

        d.   The school 'bricks are more weathered than the new ones.

(27)   a.   *The kitchen 'sink$_i$ is deeper than the bathroom e_i .

        b.   *The winter 'carnival$_i$ is more fun than the summer e_i .

        c.   The oven 'vegetables$_i$ are tastier than the boiled e_i .

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[23] Bell (2005: 19-21; 25-26)

<blockquote>
d.   The school 'bricks$_i$ are more weathered than the new e_i .

e.   The country 'bushes are more weathered than the suburban e_i .
</blockquote>

The interpretation of (27a-b) is altered once the N° is elided, whereas (27c-e) are possible, because the contrasting sentence utilises an adjective. She therefore concludes, that (27a-b) constructions cannot be syntactic. However, the impossibility of ellipsis may only indicate that the N$_1$ is not a typical ascriptive adjective, unlike what Bell claimed for MEASURE and MADE OUT OF. For example, the following sentences which contrast relational adjectives for me at least are distinctly odd, even ungrammatical, as is (27e):

(28)   a.   ?The country 'parks are better than the urban e_i .

          b.   ?His father 'instinct is more acute than our maternal e_i .

          c.   ?My communication 'skills are more developed than my linguistic e_i .

Although it could be claimed that ellipsis does not work here because relational adjectives are seemingly underlyingly nouns (cf. The discussion in the previous chapter) this data deserves a deeper investigation. While it is not my intention to uncover the details of ellipsis here, the conclusions I can draw are that MADE OUT OF and MEASURE are most-syntactic while PLACE, TIME and METHOD can not be entirely excluded.

6. General summary

Sections 2-5 of this chapter examined some specific works that have considered the semantic relations between constituents in complex nominals. While some similarities have already been noted in the discussion above, an attempt at drawing a parallel between the works, additionally incorporating Pustejovsky's (1995) qualia structure and Payne & Huddleston's (2002, P&H) 'syntactic' NNs from chapter 1, is presented in (28). A range of semantic relations are distinguished in terms of syntactic or morphological status by the authors themselves, however, I have considered semantic categories which have not explicitly been assigned to either area to belong in the 'fuzzy area' between morphology and syntax, according to what has been implied in the preceding discussions based on our compound criteria (specifically, Pustejovsky (1995) and Olsen (2002)).

(29)

	SYNTAX		← FUZZY AREA →	MORPHOLOGY
B&P (1996)	th-adjectives	c-adjs		
	Agent	Theme		
Levi (1978)				ACT; PRODUCT; AGENT; PATIENT CAUSE; MAKE; HAVE; ABOUT; BE; USE; FOR; IN (locative/temporal); FROM
Olsen (2000)			**Compound-external**: 'and'; 'made of'; 'is localized in'	**Compound-internal**: 'resembles'; 'is part of'
Puste-jovsky (1995)	Telic quale ('for') Constitutive quale ('made of') Agentive quale ('from')			
Bell (2005)	MADE OUT OF MEASURE		PLACE – TIME – METHOD	Proper Name: -location; -institution; -thing Left-head-classification
P&H[24] (2002)	MADE OF; IN; FOR WITH; TIME			

Looking at the table in (29) some overlap between the various categories defined by different authors emerges, as do conflicting conclusions as to which are morphological and which are syntactic. Many of Levi's RDPs are discussed by Bell (2005) and by P&H as being syntactic, while IN and MAKE$_2$ reflect Olsen's (2000) morphological 'is localized' and 'made of' respectively. As was mentioned above, B&P's th-adjective constructions would be considered nominalisations in Levi (1978) and the pre-head element in Levi's RDPs resemble B&P's c-adjectives. However, while Levi's transformations take place pre-surface structure, B&P proposed a purely syntactic analysis. Thus we have B&P, P&H and Bell's (2005) MADE OUT OF and MEASURE on the syntactic side of the fence and Levi (1978) and Olsen (2000) on the morphological side, even if the latter's compound-external relations strongly suggest syntactic status based on our stress criterion.

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[24] And others – see Ch.1: fn.24.

Indeed, as I stated earlier, my research will take into consideration the 'potentially syntactic' complex nominals, thereby excluding any constructions that seem to be lexical. Reiterating my assumption in chapter 1: in order for a construction to be most syntactic-like, it must be all of end-stressed, transparent and non-semantically specialised. Keeping in mind our criteria, the works carried out by Bell (2005) and P&H make direct reference to end-stress and semantic transparency, respectively. The difference in stress is also taken up in Olsen (2000) although she concludes that both fore-stressed and end-stressed NNs are lexical. Levi's work, carried out under a transformational lexical semantics approach, excludes all compound criteria.

Giving weight to our criteria for distinguishing between a phrase and a compound, I will therefore follow Bell (2005) and P&H and suggest that the most syntactic-like semantic relations are: MADE OUT OF/ MADE OF; MEASURE; PLACE/IN; TIME; METHOD/WITH. Each of these (excluding MEASURE) has a corresponding RDP in Levi (1978). Other RDPs are not discussed by Bell. There is, however, some evidence provided by P&H that FOR is somewhat syntactic-like.

Furthermore, there is some correlation between Levi's (1978) RDPs and Pustejovsky's (1995) qualia structure, although not all RDPs are accounted for under the latter's paradigm. The examples of constructions expressing the agentive quale of a noun can be easily paraphrased with 'from', for example, *bullet hole*; *lemon juice*; *hay fever*, as the telic quale can be with 'for' and the constitutive quale with 'made of Mod' Thus:

(30) a. telic quale   FOR   *plant food*, *avian sanctuary*

       b. constitutive quale   MAKE$_2$ *daisy chain*, *apple cake*

       c. agentive quale   FROM   *store clothes*, *olive oil*

If we consider Pustejovsky's qualia to be syntactic-like, as is preliminarily suggested by the parallel between the constitutive quale and MADE OUT OF[25] (re: Bell, 2005) and that between the telic quale and FOR (re: P&H discussed in Ch.1: §2.1.2), then any end-stressed

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[25] Although see Ch.5: §3.1 where we will consider there to be two distinct categories.

transparent construction manifesting FROM (cf. agentive quale) could also be considered syntactic. Thus, the data in P&H and Bell suggests that we must not exclude certain RDPs, and I therefore see no reason to exclude the remaining RDPs, such as ABOUT, FROM etc., from any analysis investigating the syntactic status of complex nominals a priori.

Finally, in anticipation of the data in chapter 5, there are two other parallels to be pointed out. The first is that between th-adjectives expressing the 'theme' role (B&P) and ABOUT (Levi). Let us consider (31):

(31) a.   *European African politics*

      b.   *European African debate*

In B&P, *politics* is a noun which is able to take both a c-adjective and a th-adjective. In (31a) the only interpretation possible is that the politics is ABOUT, or 'on' Africa (theme according to B&P: 368) carried out by the 'agent' Europe. The same thematic interpretation holds for (31b) where the *debate* is ABOUT Africa and held by the 'agent' Europe. Here again, *Africa* fills the role of theme, projected by the result nominal deverbal *debate*[26] whereas the *Africa* in (31a) would be considered a modifier of a complex nominal expressing Levi's ABOUT. Thus, it seems to me that Levi's ABOUT and B&P's 'theme' th-adjective are one and the same, where the difference lies in whether the N° is simple or deverbal, respectively.

The second parallel to note is that between the modifiers which fill the agentive quale (Pustejovsky (1995), and Levi's FROM) with the th-adjectives which express the 'agent' role (B&P). Aside from the similarity of the labels, a pre-head element in a construction which exemplifies the agentive quale of a noun may be considered to fill the same role as the agent in an agentive th-adjective + N° construction. That is, in B&P's data, restated in English in (32) below, the agent of *production*, *Galician*, has a very similar function to 'source' inasmuch as the production is a product of, or comes 'from', Galicia, just as the

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[26] As B&P point out, result nominals behave differently from event nominals with regards to the realisation of theme. That is, the internal argument of an event nominal cannot surface as a th-adjective (B&P: 357, following Kayne (1981; 1984)). It is possible, however, for a th-adjective to refer to an internal argument of a result nominal. For further discussion see Ch.5: §3.9, and B&P (pp.354-359).

coffee in (32b) comes 'from' the factory (agentive quale, or FROM):

(32) a. *Galician production of shellfish*

  b. *factory coffee*

In a construction where the N° can be both an event-denoting and a result-denoting nominal, for example, *production*, at least in English, *Galician* is interpreted as being the possessor of the production as a whole, the source of which being the factory. The context is given so as to exclude the event nominal interpretation (re: B&P: 359). That is, the amount of shellfish produced lasted only three years, not that it took only three years to produce the shellfish.

(33) *the Galician* [*factory* [*production of shellfish*]] (*...lasted only three years*)

  'Galicia's [production of shellfish from the factory] (...lasted only three years)'

  '*The production of shellfish from the factory by Galicia'

The impossibility of *Galician* to be the agent when the 'source' role is already filled by *factory* suggests that *Galician* in (32a) and *factory* in (32b) fill the same 'agentive' role, although, as was the case for 'theme' and ABOUT, the two labels 'agent' and FROM typically seem to be assigned to deverbal N°s and simple N°s, respectively. Furthermore, a modifier that refers to a physical place is more likely to produce the FROM relation, whereas an agent is often an entity capable of carrying out an action, such as a person or public figure, or even a machine.

If Levi's RDPs are mirrored in B&P's label 'c-adjective'[27], then the above hypothesis, that is, the merging of 'theme' (th-adjective) with ABOUT and 'agent' (th-adjective) with FROM, further suggests (re: the discussion of (9b) and (10b) in section 3) that c-adjectives are not to be treated as one single group. It is not the purpose of this chapter to propose any conclusions. As was mentioned earlier, however, the data in chapter 5 will convincingly show the need to adopt an approach more along the lines of Levi (1978), where prenominal modifiers are broken into categories resembling thematic roles.

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[27] An assumption I am not making given that it is not explicitly discussed or argued for in B&P's own work.

In the next chapter I will discuss the theoretical paradigm which will be adopted in my analysis, from which we will be able to narrow down our group of potentially syntactic complex nominals.

Chapter Four: *Theoretical paradigm*

This chapter is divided into five sections. Section 1 will present the theoretical paradigm within which this dissertation will find its course, while in sections 2-4 we will discuss three important works within this paradigm that will be fundamental in formulating the thesis in this dissertation. Finally, section 5 will present the theoretical basis for my dissertation, based on the assumptions and analyses presented in sections 2-4.

1. Cartographic studies

A recent approach to the explanation and description of syntactic constructions, "The Cartography of Syntactic Structures"[1] is a paradigm which, as the name suggests, sets out to draw a map of syntactic configurations (Cinque & Rizzi (2008: 51). As a theoretical concept, the cartographic approach is a relatively new paradigm although it has in fact been a developing area of linguistics, even if not under this same title, since the 90s, around when Minimalism emerged (Cinque & Rizzi: 58).

Indeed, one of its principal characteristics is its inclusion of rich functional structure, the emergence of which was first stimulated during the eighties by the extension of X-bar theory to the functional elements within the clause (Chomsky (1986) and later Pollock (1989)) and within nominal expressions (Abney, 1987). As such, lexical projections are embedded in functional structure, or better, functional projections (henceforth FPs). The functional heads of these projections correspond to abstract semantic specifications, such as tense, mood, aspect, modality, and so on.

Thus we have the clausal projection being extended from VP to IP (inflection phrase) and to CP (complementiser phrase) in Chomsky (1986) so that the sentence: "*I think that John understands the problem*" can be mapped as in (1):

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[1] Being so recent, the name itself refers to six volumes to have been published in the comparative syntax series by OUP.

(1)

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                    IP
          Spec          VP
          NP    I°   Spec   V°
          △      NP         think   Spec        CP
          I                              C°           IP
                                         that    Spec     I°        VP
                                                  NP              V°      NP
                                                  △      understands  △
                                                  John                the problem
```
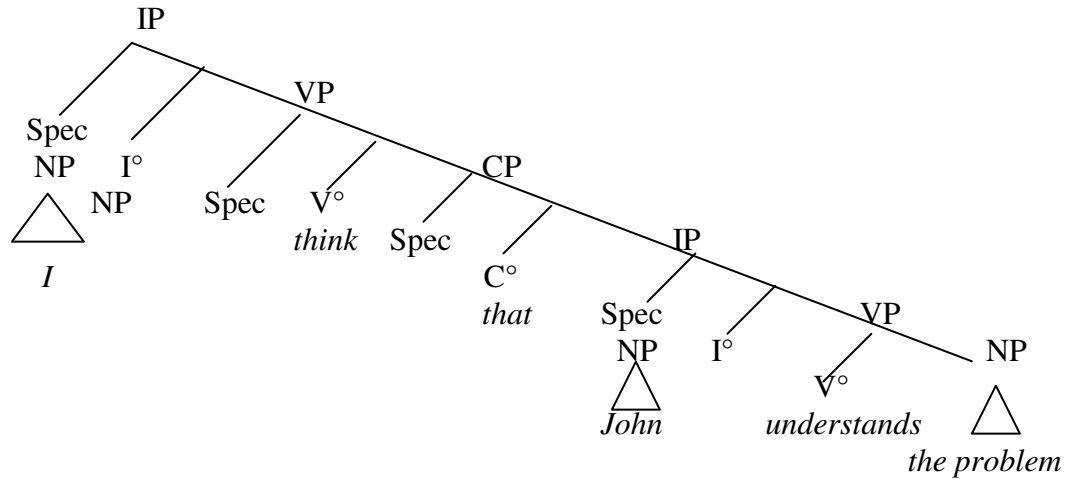
Pollock (1989) further broke down the IP, resulting in TP (tense phrase) and AgrP (agreement phrase) and an additional NegP (negation phrase) based on the observation that there are multiple positions for verbs in negative French sentences and that one unique position under IP would not account for this variation. Finite verbs (2a – 2b) and auxiliaries (2c – 2d) move obligatorily to be placed between the two negation elements (*ne* and *pas*), while the infinitival verb may either stay in its VP internal base position (2e), or move to a position higher than the adverb, lower than both negation elements (2f), but may not move higher than *pas* (2g)[2].

(2)   a.   Violetta ne <u>mange</u> pas de chocolat

               Violet   *ne* eats   not   chocolate

      'Violet does not eat chocolate'

      b.   *Violetta ne   pas   <u>mange</u> de chocolat

               Violet   *ne* not   eats   chocolate

      c.   Violetta n' <u>a</u>   pas mangé de chocolat

               Violet   *ne* has   not eaten   chocolate

      d.   *Violetta ne   pas   <u>a</u>   mangé de chocolat

               Violet   *ne* not   has   eaten   chocolate

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[2] Examples taken from Haegeman (1994: 593; 596). For further detail, see Pollock (1989) or Haegeman (1994) and references cited there.

e.   Ne pas souvent <u>arriver</u>   en retard, c'est triste

      ne not often   to arrive   late   it is sad

      'It is sad to not often arrive late'

f.   Ne pas <u>arriver</u> souvent en retard, c'est triste

g.   *Ne <u>manger</u> pas de chocolat, c'est triste

       ne to eat   not chocolate it is sad

The extended IP structure was subsequently proposed as (3)[3]:

(3)   CP[spec,C° AGRP[spec, Agr° NegP[spec,Neg° TP[spec,T° AuxP[spec,Aux° VP[spec,V°]]]]]]

Functional nominal structure was established by Abney (1987) who extended the NP to DP
(determiner phrase) assuming that clausal and nominal structures were essentially parallel
(a by now well accepted assumption), whereby if VP is dominated by the functional
projections AgrP and TP, NP is also dominated by some functional projection. Evidence
for this comes from overt marking of Agr in languages such as Turkish and Hebrew (see
Abney (1987: Ch.2) for detail). Lacking overt morphology, English is claimed to base
generate the determiner under nominal Agr°, which assigns abstract genitive case[4]:

(4)
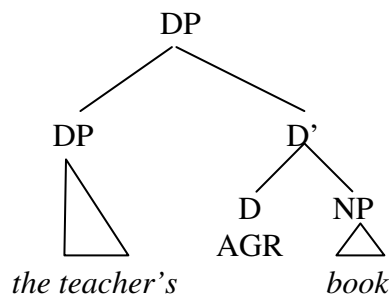
Since Abney's seminal work, the DP has been extended to include NumP (Ritter, 1991),
and, more recently, to a large number of functional projections corresponding to the
semantic specifications of adjectives such as SizeP, AgeP, ColourP and so on (see
especially Scott (2002) and the discussion in 1.3 below).

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[3] Although Pollock in his original (1989) paper proposed the order TP > AgrP, Belletti (1990) and others later
argued for the inverse order (AgrP > TP) on morphological grounds.
[4] Haegeman (1994: 610)

The cartography paradigm assumes that the hierarchical order of FPs dominating the lexical projections VP, NP, AP etc., may be universal, although the type of movements and overt realisation of Spec or X° may be language specific (Cinque & Rizzi: 54, and references cited there). In particular, Cinque (1999) postulates a universal hierarchy of a vast array of functional projections within the clause based on data from a large number of languages which show strict orderings between adverbs and between overtly realised functional morphemes.

Following Cinque and the method of ascertaining ordering restrictions, Schweikert (2005) proposed a rigid hierarchy of PPs which closely resembles the order of adverbs, and Scott (2002) extends the clausal hierarchy of adverbs to adjectives in the DP[5]. The principle behind ordering restrictions under this line of approach is necessarily transitivity: (A > B; B > C = A > C)[6] inasmuch as it is rare to find more than two or three adverbs or functional morphemes co-occurring within a single sentence. In what follows, the three aforementioned studies will be discussed.

2. Cinque (1999)

In his (1999) book, Cinque aims to argue for a "functional-specifier" analysis whereby adverb phrases (AdvPs) are universally base-generated in the specifiers of distinct functional projections, a consequence of which is the rejection of the proposal that adverbs are 'free' recursive adjuncts[7]. This analysis follows on from Kayne's (1994) antisymmetrical approach where one unique (left-branching) specifier is available for each functional projection (Kayne, 1994: 16) and the only adjunction permitted is that of head to head. The implications of such a theory are that AdvPs are rigidly ordered in unique specifier positions, and not freely adjoined.

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[5] It must be noted that many of the fundamentals underlying the cartographic approach are also adopted in the Minimalist Program (Chomsky (1995) and much later work), despite the apparent conflict between basic 'minimalist' structures and the array of functional projections proposed by cartographic studies. In actual fact, this conflict is indeed only apparent: the two projects complement each other. While cartographic studies can be seen as a development of the structural intricacies, the MP aims at minimalising the generating mechanisms. See Cinque & Rizzi (2008) for a comprehensive discussion.

[6] Though see references cited in Cinque & Rizzi (2008: fn.6) for claims against the validity of transitivity.

[7] See Alexiadou (2004) for a recent overview of the specifier vs. adjunct debate.

In order to demonstrate just that, Cinque (1999) presents us with two observations. First, it is possible to map out a rigidly ordered hierarchy of adverb classes through observations on ordering restrictions in a range of languages. For example, the Italian negation element *mica* 'not' must precede *già* 'already' (5), which, in turn, precedes *più* 'any longer' (6) According to our transitivity rule above, *mica* then necessarily precedes *più*, a hypothesis that proves to be correct (7)[8]:

(5)   a.   *Non hanno mica già chiamato, che io sappia*
            'They have not already telephoned, that I know'

      b.   **Non hanno già mica chiamato, che io sappia*
            'They have already not telephoned, that I know'

(6)   a.   *All'epoca non possedeva già più nulla*
            'At the time (s)he did not possess already any longer anything'

      b.   **All'epoca non possedeva più già nulla*
            'At the time (s)he did not possess any longer already anything'

(7)   a.   *Non hanno chiamato mica più da allora*
            'They haven't telephoned not any longer, since then'

      b.   **Non hanno chiamato più mica da allora*
            'They haven't telephoned any longer not, since then'

Secondly, in both agglutinative languages (such as Korean, Turkish etc.) and inflectional languages (English, Spanish and Hindi for example), there is a strict ordering of suffixes which encode semantic specifications such as aspect, modality and tense. Moreover, this order proves to be the mirror image of free functional morphemes in the VP such as auxiliaries and particles (see Cinque, 1999: Ch.3), in accordance with Baker's mirror principle (see Cinque (1999: 52) and references cited therein). Thus, an overall ordering of functional heads is obtained.

Cinque (1999: 106) subsequently produces an integration of the two hierarchies (that of adverbs and that of functional heads), demonstrating that there is a specific one-to-one

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[8] Examples taken from Cinque (1999: 5).

relationship between AdvPs and the functional heads with which they semantically correspond:

(8) [Mood$_{\text{speech act}}$ *frankly* [Mood$_{\text{evaluative}}$*fortunately* [Mood$_{\text{evidential}}$ *allegedly* [Mod$_{\text{epistemic}}$

   probably [T$_{\text{past}}$ *once* [T$_{\text{future}}$ *then* [Mod$_{\text{irrealis}}$ *perhaps* [Mod$_{\text{necessity}}$ *necessarily*

   [Asp$_{\text{habitual}}$ *usually* [Asp$_{\text{repetitive (I)}}$ *again* [Asp$_{\text{frequentative (I)}}$ *often* [Mod$_{\text{volitional}}$ *intentionally*

   [Asp$_{\text{celerative (I)}}$ *quickly* [T$_{\text{anterior}}$ *already* [Asp$_{\text{terminative}}$ *no longer* [Asp$_{\text{continuative}}$ *still*

   [Asp$_{\text{perfect}}$ *always* [Asp$_{\text{retrospective}}$*just* [Asp$_{\text{proximative}}$ *soon* [Asp$_{\text{durative}}$ *briefly*

   [Asp$_{\text{generic/progressive}}$ c*haracteristically* [Asp$_{\text{prospective}}$ *almost* [Asp$_{\text{sg.completive (I)}}$ *completely*

   [Asp$_{\text{pl.completive}}$ *tutto* [Voice *well* [Asp$_{\text{celerative (II)}}$ *fast/early* [Asp$_{\text{repetitive (II)}}$ *again*

   [Asp$_{\text{frequentative (II)}}$ *often* [Asp$_{\text{sg.completive (II)}}$ *completely*

Structurally, each functional morpheme is seen to be the overt realisation of an F$^{\circ}$[9] which licenses a unique specifier position where an AdvP corresponding to the semantic specification represented by the FP is base-generated. Evidence for this comes from the observation that there may be an F° immediately to the right, and to the left, of an adverb which may host the V or an auxiliary, and, as was mentioned above, the precise observation that the order is rigid, and not free (as would be expected if AdvPs were adjoined).

A desirable consequence of the 'AdvP in spec' claim is that the adverbs are mapped out in a linear fashion according to the order, deemed universal, of FPs – a consequence highly compatible with Kayne's (1994) antisymmetrical model.

However, the inclusion of such a rich hierarchy in the clause naturally demands that we ask two questions. Is this hierarchy indeed universal? And, is this functional structure present in every sentence? Regarding the first question, Cinque notes (1999: 127) that the only apparent cases of variation to the order (outlined in (8) above) across the data from the numerous languages cited involve AgrPs and NegPs, which in actual fact can potentially

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[9] In languages which manifest overt functional head morphemes (e.g., Guyanese Creole, Sranan – see Cinque, 1999: Ch.3), the F° is present. In other languages, such as English, Italian etc., the FP is phonologically null or "empty-headed".

appear in different positions in general, and thus suggest a language specific parameter of whether or not the higher or lower AgrP/NegP is overtly realised[10]. Furthermore, it seems that the same functional notions consistently surface in languages, either in the form of a head morpheme, or as an adverb. Other potentially conceivable notions, however, do not[11].

Insight on the second question asked comes from evidence that tentatively suggests the primitive nature (belonging to UG) of functional hierarchies. The evidence proposed rests around the consideration of 'default' and 'marked' as fundamental notions in UG. Simplifying considerably, Cinque (1999: 128) follows two of Jakobson's[12] observations regarding which value is marked and which is instead default, and claims that the existence of both values in each functional projection suggests that these functional projections indeed make up a part of UG. The two (again, simplified) observations are as follows: 1) an unmarked (default) category is generally vague between the two values, while the marked category is not, and 2) the lack of morphology is typically seen (or not seen, as the case may be) with unmarked categories. The default value of the epistemic modal head is "the truth" (needing no overt morphology, or adverb, cf. the second of the above two observations) which, if explicitly denied (Cinque gives the adverbs *probably, presumably*) then becomes the marked value.

In conclusion, Cinque himself notes that (1999: 141) "*Many specific claims will have to be modified; others rejected*", attempts at which have in fact been carried out in recent literature[13]. Other studies, however, have provided further support for the functional-specifier approach in both the clausal and the nominal domain, as we will see below (§3 and §4)

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[10] Cinque additionally (p.141) notes that "Although many (perhaps most) of the relative orders among functional elements may ultimately reduce to scope relations among what we can take to be different operators (over the predicate-argument nucleus of the sentence), not all orders are so explicable, it seems. In this case, the hierarchy of functional projections may turn out to be a property of the computational component of UG". See also the discussion in Cinque & Rizzi: 61-62.

[11] See Cinque (1999: 132-134 and 224, fn.10)

[12] 1939; 1957; 1971 in Cinque (1999).

[13] In subsequent work, Cinque (2004) specifically addresses some such attempts (for an overview of the literature to have criticised this approach, see Cinque, 2004: fn. 3).

3. Schweikert 2005

Despite the seemingly liberal order of preverbal circumstantial prepositional phrases (PPs) in German, Schweikert (2005) shows that, on the contrary, they are rigidly ordered. The evidence that Schweikert (2005) offers is based on three main tests applied to 14 circumstantial PP types in German, examples of which are closely related to the thematic roles of constituents in the clause (e.g., 'temporal' *he slept **on Sunday***, 'benefactive' *the flowers were bought **for his wife***, 'instrumental' *they delivered the goods **with a truck*** etc.). The tests employed were 'quantifier scope (QS)', 'pair-list reading (PLR) and 'informational focus (IF)'. A rigid order also proves to exist between postverbal circumstantials in English. The hierarchy, however, is the mirror image of that in German.

Following on from Cinque's analysis whereby adverbs are located in the specifier of unique functional projections, Schweikert assumes that there is one unique position for each PP based on data from German which demonstrates that two of the same type of PP must not be present in a sentence, unless coordinated by *und* ('and') (Schweikert, 2004: 50).

(9) a.   *Hans arbeitete für Herr Mayer für Herr Muller*
           Hans worked for Mr. Mayer for Mr. Muller
     b.   *Hans arbeitete für Herr Mayer und für Herr Muller*
           Hans worked for Mr. Mayer and for Mr. Muller

Semantically there is nothing that prohibits Hans from working for two people, suggesting that this restriction is syntactic, and not semantic, and one that is not predicted by adjunction theories. He therefore concludes that there is one syntactic position for each PP type, a hypothesis which is supported by the ordering restrictions that emerge between circumstantials. What follows is a summary of the tests that led Schweikert to establish his hierarchy of PPs [14] (§3.1 – §3.4). Finally, in section 3.5 we will briefly discuss some cross-linguistic evidence from Japanese that further supports Schweikert's conclusions.

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[14] The data given here are the examples given by Schweikert. However it must be pointed out, as the author very often does so himself, that the data rarely provides clear examples and instead of a clear-cut judgement, he often had to work with asymmetries, or better, 'this examples is much better than the other'. See Schweikert (2005: Ch.3) for further detail.

3.1 Quantifier Scope (QS)

Given the assumption that a quantifier can take scope over another quantified expression or its trace, if a constituent with, for example, a universal quantifier is moved over a constituent with an existential quantifier, scope ambiguities arise. If however, no movement is involved, the scope interpretation of the quantified phrases is no longer ambiguous (in this case, existential > universal), In an example such as (10) below, the single interpretation available is that of a universal (*jedem* 'every') over an existential (*mindestens einer* 'at least one') quantifier, (for every year, there was at least one (potentially different) disease that caused me to go to the doctor). The interpretation whereby the existential quantifier takes scope over the universal one is unavailable (there was at least one (single) disease that caused me to go to the doctor each year). In (11), on the other hand, both interpretations are possible (examples taken directly from Schweikert 2005: 67 – 68):

(10)   *Ich bin in jedem Jahr wegen   mindestens   einer Krankheit zum   Arzt   gegangen*

       I   am in every year because of_at_least one   disease to_the doctor   go.PART

       "I went to the doctor every year because of at least one disease"

(11)   *Ich bin wegen   mindestens einer Krankheit in jedem Jahr   zum   Arzt   gegangen*

       I am because_of at_least   one   disease   in every year to_the doctor go.PART

       "I went to the doctor because of at least one disease every year"

Furthermore, Schweikert notices that if one switches the quantifiers in (10), the only interpretation possible is existential over universal (12), and thus, the data from (10) – (12) shows that the base order must be Temporal PPs > Reason PPs.

(12)   *Ich bin in mindestens einem Jahr   wegen   jeder Krankheit zum   Arzt   gegangen*

       I am in at_least   one year because_of every disease to_the doctor go.PART

       "I went to the doctor because of every disease in at least one year"

3.2 Pair-List Reading (PLR)

Similar to QS, a pair-list reading is only possible when the fronted constituent in a question c-commands its trace. For example, while the question in (13a) can have either a single

constituent reading (13b), or a pair-list reading (13c), as an answer, whereas in (14) the PLR is unavailable due to relativized minimality (Rizzi, 1990)[15].

(13) a.   Which sheet$_i$ did he drape [t$_i$] over every armchair?

      b.   'It was the black sheet that he draped over every armchair'

      c.   'He draped the black sheet over the large armchair,

            the white sheet over the small armchair and

            the green sheet over the old armchair.'

(14) a.   Which armchair$_i$ did he drape every sheet over [t$_i$]?

      b.   'It was the small armchair that he draped every sheet over.'

      c.   '*Over the small armchair, the black sheet;

            over the big armchair the green sheet etc.'

Schweikert applies this test to circumstantials (p.83), showing that the PLR is only available when the lower PP is not wh-moved over the higher PP (15). When it is, (16)[16], only the single constituent reply is possible.

(15) a.   *Wo   hat Hermann an jedem Tag gespielt?*

            Where has Hermann on every   day   play.PART

            "Where did Hermann play each day?"

      b.   'Wimbledon'

      c.   'Wimbledon on Monday, New York on Tuesday, Bath on Wednesday etc.'

(16) a.   *Wann hat Hermann in jeder Stadt gespielt?*

            When has Hermann in every town play.PART

            "When did Hermann play in every town?"

      b.   'Last weekend.'

      c.   '*Last weekend in Berlin, yesterday in Paris'

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[15] Examples (13a-c) and (14a) taken from Bruening (2001: 236f.) in Schweikert (2005: 82); (14b-c) are mine.
[16] For this particular example, Schweikert does not give the German replies. For ease of understanding I will add the English examples he cites in the body of the text (15/16b-c).

The above examples, according to the asymmetries noticed between Wh-operators and universal quantifiers, therefore suggests the order Temporal PP > Locative PP.

3.3 Informational Focus (IF)

A sentence that conveys two pieces of information can often be divided into the constituent that expresses the 'old information', something which has already been mentioned – the topic – and the constituent that conveys the 'new information', or the focus of the sentence, which will consequently be stressed. Schweikert (2005: 79), following Lenerz (1977, in Schweikert (2005)), observes that in German the order of the two constituents is free only when the higher constituent is that being stressed. This can be identified through the answers to a question. For example, in (18), the focused constituent *am Sonntag* 'on Sunday' (temporal PP) can either follow or precede the topic *in München* 'in Munich' (locative PP), while in (19), the focused constituent, this time the locative PP, may not precede the temporal PP. This data, combined with the examples (15) and (16), would then provide further evidence that the order is Temporal PPs > Locative PPs.

(17)   *Hans   hat am Sonntag in München geschlafen*
        Hans has on   Sunday in Munich   sleep.PART
        'Hans slept in Munich on Sunday'

(18)   *Wann hat Hans in München geschlafen?*
        'When did Hans sleep in Munich?'
        Hans hat in München <u>am Sonntag</u> geschlafen.
        Hans hat <u>am Sonntag</u> in München geschlafen.

(19)   *Wo hat Hans am Sonntag geschlafen?*
        'Where did Hans sleep on Sunday?'
        Hans hat am Sonntag <u>in München</u> geschlafen.
        ??*Hans hat <u>in München</u> am Sonntag geschlafen.*

3.4 Schweikert's conclusions

For each of these three tests, Schweikert arrives at a hierarchy of the 14 PPs under examination (p.132). In a direct comparison of the three orders, the result is consistent, and the following linear order is obtained[17]:

(20) [Evidential *according to a witness* [Temporal *on Sunday* [Locative *on the table*
[Comitative *with his colleague* [Benefactive *for his wife* [Reason *because of the rain* [Source *from Munich* [Goal *to Munich* [Malefactive *against the bad weather* [Instrumental *with a knife* / Means *by train* / Path *through Milan*[18] [Matter *about mathematics* [Manner *in a special way*

This resulting hierarchy of preverbal circumstantials in German is then applied to a limited sample of English data. The base order of circumstantials in English is claimed to be the mirror image, through observations that the scope relations which hold in German are also present in English (p.130). Restating (17), the pre-verbal German order would be Temporal PP > Locative PP > V°, while the post-verbal English order would be V° > Locative PP > Temporal PP:

(21) a. Hans hat <u>am Sonntag</u> <u>in München</u> geschlafen

                        Temporal   Locative   V°

     b. Hans slept <u>in Munich</u> <u>on Sunday</u>

                V°   Locative   Temporal

Schweikert (2005) claims that a syntactic hierarchy of functional thematic roles exists above the VP shell and proposes a Kayne-style analysis whereby prepositions are base-generated higher than their to-be complements, the latter being moved into KP from their lower base position in order to meet case requirements[19].

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[17] The lexical realisation of each PP is given in English for explanatory purposes.
[18] Schweikert was unable to clearly ascertain an ordering of instrumental, means and path – see (p.108ff.) of the text for discussion.
[19] I have thoroughly simplified the intricacy of Schweikert's (2005) analysis. The reader is referred to chapter 4 of the text, as well as to the original proposal argued for by Kayne (2002).

(22)
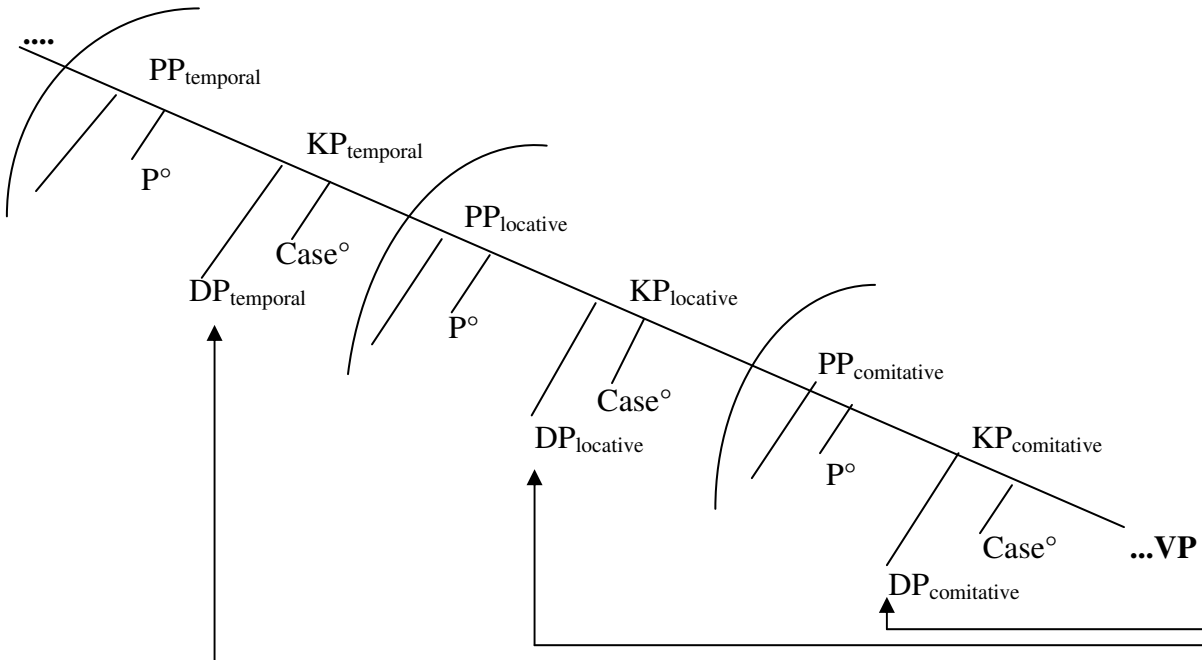
The above structure predicts the correct order of the preverbal circumstantials in German. In order to account for the mirror-image order in English, however, Schweikert employs remnant movement (Cinque (2000) and much subsequent work). Simplifying greatly, the VP would first move to an intermediate position between the lowest two PPs (in (22) this would be an intervening position above PP$_{comitative}$ and below KP$_{locative}$), and would subsequently roll up above each successive PP (in (22) first above PP$_{locative}$, then PP$_{temporal}$) carrying its entire remnant with each step[20]:

(23)   a. ... [on Sunday] [to Munich] [with Jane]   went   →

       b. ... [on Sunday] [to Munich] went$_i$ [with Jane] t$_i$ →

       c. ... [on Sunday] [went$_i$ [with Jane] t$_i$]$_j$ [to Munich] t$_j$ →

       d. ... [[went$_i$ [with Jane] t$_i$]$_j$ [to Munich] t$_j$]$_k$ [on Sunday] t$_k$

Thus, the functional-specifier approach finds further support in the domain of circumstantial PPs whereby functional projections are not only argued to be present, but

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[20] The details of remnant movement are not relevant for the present purposes. For a more comprehensive discussion, see Cinque (2006) and references cited there.

their hierarchical ordering furthermore overlaps with that which is obtained in adverbial syntax.

3.5 A hierarchy of PPs in Japanese (Takamine, 2010)

As was noted for German by Schweikert (2005), Takamine (2010) also observes that the relative order of modifier PPs in Japanese appears to be unconstrained (examples taken from Takamine, 2010: 1):

(24) a.   Taro-ga   [$_{Temp}$nichiyoo-ni] [$_{Loc}$uraniwa-de] [$_{Inst}$ono-de]   ki-o   kitta

            Taro-NOM   Sunday-TEMP   backyard-LOC   ax-INST   tree-ACC   cut

       b.   Taro-ga   [$_{Loc}$uraniwa-de] [$_{Temp}$nichiyoo-ni] [$_{Inst}$ono-de]   ki-o   kitta

            Taro- NOM   backyard- LOC   Sunday- TEMP   ax- INST   tree-ACC   Cut

       c.   Taro-ga [$_{Inst}$ono-de] [$_{Temp}$nichiyoo-ni]   [$_{Loc}$uraniwa-de]   ki-o   kitta

            Taro-nom   ax- INST   Sunday- TEMP   backyard-LOC   tree-ACC   Cut

However, through the application of the same diagnostic tests that Schweikert implements in German, Takamine successfully shows that there is a consistent underlying hierarchy of PPs in Japanese. Importantly, the order she obtains reflects the order obtained by Schweikert (discussed in §3.4 above, reiterated in (25)):

(25)

       a.   Evidential > **Temporal** > **Locative** > **Comitative** > Benefactive > **Reason** > **Source** > **Goal** > Malefactive > **Instrumental/Means** > Path > Matter > **Manner** > V°

                                                      (Schweikert, 2004: 132)

       b.   **Temporal** > **Locative** > **Comitative** > **Reason** > **Source** > **Goal** > **Instrumental/Means** > Material > **Manner** > V°

                                                        (Takamine, 2010: 178)

The rigid ordering of circumstantials in both Japanese and German strongly supports the functional-specifier approach advocated by Cinque and indeed the cartographic framework in general. Naturally, a more extensive cross-linguistic investigation is required. However, the preliminary data that we do have suggests that there is indeed an underlying, possibly

language universal, ordering of grammatical functions in the clause. The next section will discuss a recent work to have outlined the hierarchy of elements in the DP.

4. Scott 2002

One of the earliest works in ordering restrictions within the DP is the Universal 20 proposed by Greenberg (1963), who made a number of observations regarding language universals. Specifically in terms of the DP, he claimed that:

(26)   Universal 20

"*When any or all of the items (demonstrative, numeral, and descriptive adjective) precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite*". (p.87)

While this claim, or better, the investigation of the attested orders between demonstrative, numeral, adjective and noun in the world's languages, has been revised over the years[21], some interest in the ordering restrictions between two or more adjectives in the DP has subsequently emerged[22].

In particular, building on general observations on the order of prenominal adjectives in English such as those recorded by Kingsbury and Wellman (1986), Scott (2002) calls upon data from a large range of languages such as Finnish, Welsh, Serbo-Croat and English (among others) and extends the traditional 'order of adjectives' in (27)[23] below to a much richer array of functional projections similar to Cinque's hierarchical map of adverbs in (28) (Scott, 2002: 114).

(27)   Determiner > Subjective comment > Size > Age > Shape > Colour > Nationality/Origin > Material > Compound element > N°

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[21] Most recently, Cinque (2005), demonstrates that all of the attested orders (in total 14) can be derived from the base order Dem > Num > A > N° through movements otherwise independently motivated in UG. This would suggest that ordering restrictions indeed make up an integral part of UG, at least to some degree.
[22] See Scott (2002: 91/fn.2) for references.
[23] Taken from Kingsbury & Wellman (1986: 40) in Scott (2002: 99).

(28)   Determiner > Ordinal number > Cardinal number > Subjective comment >
        ?Evidential > Size > Length > Height > Speed > ?Depth > Width > Weight >
        Temperature > ?Wetness > Age > Shape > Colour > Nationality/Origin > Material >
        Compound element > N°

Following Cinque's functional-specifier approach for adverbs, each adjective or adjective phrase (AP) is seen to be hosted in the specifier position of a FP, whose F° contains the feature bundle corresponding to the semantic class of the adjective[24]. In English the F-heads are lexically empty, for example, *a long red dress* would have the following structure[25]:

(29)

```
        DP
       /  \
      D    LengthP
      a   /   \
       Spec    \
        AP    Length°   ColourP
       /\       e      /    \
      long           Spec    \
                      AP   Colour°    NP
                     /\       e      /  \
                   red              N°
                                   dress
```
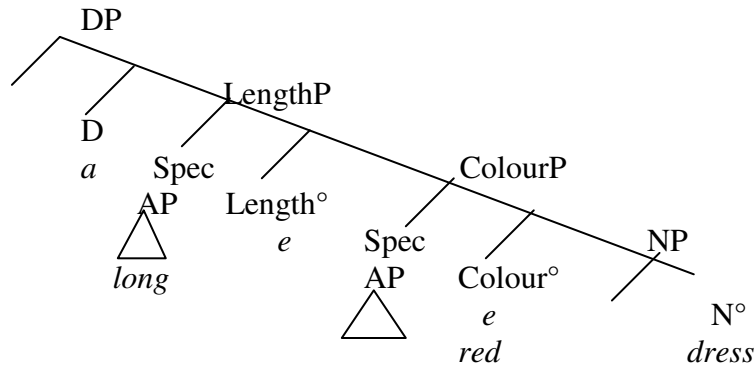
In partnership with the minimalist program this approach leads to two important consequences, that is, any adjective may have any number of semantic interpretations, depending on which Spec it is generated in, and, potentially any constituent can appear in the spec of FP, including phrases and nouns. Scott (p.102) presents his discussion as follows. Firstly, the adjective in the spec of an FP, following the logic of Chomsky in minimalism (1995: 396), is both a head, inasmuch as it does not branch; and also a phrase,

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[24] "If adverbs are, as Cinque suggests, the specifiers of such FPs as $Mood_{speech\_act}P$, $Asp_{proximate}P$, $T_{Future}P$ – that is, of the FPs that reflect the semantic classes by which they pattern in linear ordering – it seems reasonable, and by Uniformity indeed theoretically desirable, to assume that adjectives, their nominal counterparts, are likewise treated as the specifiers of FPs that reflect the semantic classes according to which they are ordered." (p.98)

[25] The universality of this hierarchy and the movements, if any, required to obtain the order in (28) are two issues far bigger than the scope of the present work (see Cinque & Rizzi (2008) for further discussion of these issues in the cartographic framework). For now I will merely focus on the general theoretical paradigm, the functional-specifier approach. In addition, I must point out the presence and nature of any intermediate XPs, such as KP, are not included in Scott's analysis as they are in Schweikert's (2005).

in that it does not project any further. It can therefore be entirely lexical, while the FP in which it is generated can equally determine its semantic interpretation. Consequently, an adjective may manifest the same lexical form, but depending on which FP it is generated in, can have two differing semantic interpretations, for example *old* (=former) or *old* (=ancient).

Secondly, on a similar note, if it is the FP to determine the interpretation, it follows that any element which semantically corresponds to the features expressed by the F° may be generated in Spec, FP. For example, Scott claims that a constituent such as *off-the-cuff* manifests both PP and adjectival characteristics, thereby having both PP and AP status. The same logic would then apply for an NP such as *steel bridge* or *morning prayers*. By way of the line of reasoning outlined above, *off-the-cuff* remains a PP, and *steel bridge* and *morning prayers* remain NPs, however their semantic interpretation is assigned by the hosting FP. In fact, the next section will show how the possibility of a NP in a specifier position is crucial to the argumentation I present here.

5. Extending Schweikert (2005) and Scott (2002)

Specifically drawing on the analyses in Schweikert (2005) and Scott (2002), and in particular their significance for the present work, the following points emerge from the overall functional-specifier approach:

(30)

    a. APs are generated in spec, FP where the features manifested in F° correspond to the lexical semantics of A°.

    b. There is a hierarchical order of the FPs within the DP, ascertained through ordering restrictions and differences in scope interpretation.

    c. The lowest FP in the DP is 'MaterialP[26]' *rosewood/brass* (Scott, 2002: 102).

    d. Potentially, any element could be in the spec of an adjectival FP, crucially, an NP.

---

[26] Takamine (2010) shows that the 'material' PP in Japanese belongs to the lowest domain, appearing just higher than matter. In the next chapter I show that 'material' is in fact higher than all of temporal, locative, source etc., seemingly contradicting her analysis. I will ultimately suggest in chapter 6 that what Scott refers to as MaterialP, and what I discuss under MATERIAL in my analysis, is possibly different from what comes under 'Material' in Takamine's (2010) work.

Lower than MaterialP, Scott (2002) alludes to a 'compound element'. In chapter 2, we stated that the term 'complex nominal', despite having its origins as a process of word formation within a transformational approach (cf. Levi, 1978), will apply here to any NN or RelAN sequence, and potentially to constructions traditionally considered compounds. Scott's 'compound element' is therefore our complex nominal. Suppose we now add some of the observations regarding complex nominals:

(31)

    a. There is strong evidence for the syntactic nature of certain complex nominals (specifically those that express the relations 'location', 'time', 'made of', the latter strongly resembling MaterialP).

    b. The semantic predicates manifested between the constituents of complex nominals, namely Levi's RDPs FOR, IN, WITH, ABOUT, etc., closely resemble Schweikert's circumstantial PPs, i.e., thematic roles, as can be seen by the paraphrasing in the table (32) below (and as was noted in Ch.3: §3 (14)):

(32)

THEMATIC ROLE[27]	**NP + circumstantial**	**Complex Nominals**
Evidential	The thesis [**according to** Jane/the President]	*The *Jane/President(ial) thesis*
Temporal	The prayers [**in** the morning]	*The morning prayers*
Locative	The note [**in** the margin]	*The margin/marginal note*
Comitative	The meeting [**with** Jane/the President]	*The *Jane/President(ial) meeting*
Benefactive	The concert [**for** world-peace]	*The world-peace concert*
Reason	There is a delay [**because of** the strike]	*The strike delay*
Source	The butter [**from** the country]	*The country butter*
Goal	The trip [**to** London]	*The London trip*
Malefactive	There is a strike [**against** salary cutbacks]	*The salary cutback strike*
Instrumental	They gave him a wound [**with** a knife]	*The knife wound*
Means	The translation [**by** machine]	*The machine translation*
Path	The route [**through** L.A]	*The L.A route*
Matter	The lecture [**about** morphology]	*The morphology lecture*
Manner	The present wrapping [**with** love]	**The love present-wrapping*

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[27] Restricting the group to the 14 discussed in Schweikert (2005).

Returning to the by now well-attested parallel between CP and DP, given the correlation between the semantic predicates found in complex nominals and clausal thematic roles, we could preliminarily stipulate that a range of FPs corresponding to circumstantials (thematic roles) in the clause are also present in the DP – within complex nominals – following MaterialP, replacing 'compound element'.

Following the argumentation outlined in chapter 2 regarding the parallelism between relational adjectives and nouns (with the noted exception regarding anaphora, to which we will return below), the same construction would be given to a complex nominal composed of an NN, such as *margin note* as it would be to one which includes a relational adjective (c.f. *marginal note*) inasmuch as the internal structure of the modifier is fundamentally the same. In chapter 2 (§4) we proposed two potential structures for modifiers in a complex nominal, an nP (where the noun would remain an nP and not undergo the second merge with the $a_{defective}$) or a relP.

(33)
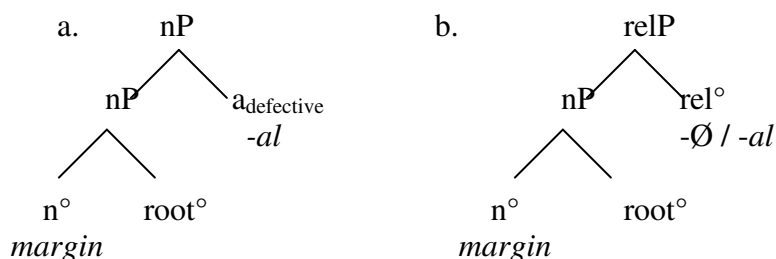
Subsequently, a complex nominal would be composed of a NP containing the head noun modified by either an nP or a relP. In order to explain the noun-like qualities of relational adjectives, it seems advantageous to consider both modifiers as nouns and perhaps adopt the structure in (33a), which, following the functional-specifier approach, would be base-generated in the specifier of the semantically corresponding FP.

Recall from chapter 2 (§3), however, that relational adjectives and nouns do not always behave similarly. That is, an anaphoric pronoun cannot refer to a relational adjective in a complex nominal, but can, on the other hand, to a nominal modifier (except within complex nominals manifesting the relations 'theme/about' and 'agent/source' – to also be discussed

below). In order to account for this behavioural difference I claim here that the modifier in a complex nominal always starts out as a nP, with no defective affix, receiving its affix from a higher projection in the case of a relational adjective.

We can think of the structure projected by the N° as being identical to that which we find in the clause in Schweikert's analysis whereby KPs exist for each thematic relation present in a complex nominal into which the nominal modifier raises from its base position (spec, FP) in order to check its thematic features. Above the KP is a RelAP, analogous to Schweikert's PPs, into which the nominal modifier subsequently raises if there is a relational suffix available[28]. If, on the other hand, there is no suffix available, or is not selected, an empty P° must be inserted immediately above KP in order to license the nominal modifier.

The structure is depicted below in (34), showing the relative ordering of Scott's ColourP, MaterialP[29] and 'compound element', which, as we have argued, may be divided into the different thematic relations present in complex nominals.

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[28] Abstracting away from any change in phonological form, i.e., *morphology* + *-cal*→ *morphological*; *microscope* + *-ic* → *microscopic*, and from the substitution with a suppletive form: *night* → *nocturnal*; *city* → *urban*. As we saw in chapter 2 (§3), anaphoric reference is even possible within suppletive forms, suggesting that the underlying noun is still accessible despite the surface phonology. See Koshiishi (2002) for a general overview of the issues surrounding the suppletive forms of relational adjectives.

[29] MaterialP does not have a thematic relation associated with it and may therefore be projected higher than all complex nominals. The analysis in the next chapter will show that MATERIAL is the highest of all semantic relations considered, leaving the question open as to whether 'material' complex nominals are in fact APs along the lines of typical ascriptive APs or whether they undergo the same operations as the complex nominals whose modifiers fill a thematic role. The issue will not be further pursued here. However, for descriptional purposes, and for consistency with the previous literature on the topic, in the structure in (34) I will place MaterialP above all other 'thematic' complex nominals.

(34)   ….. [*red* [*woollen* [*autumnal* [*city* [......**N°**]]]]]

DP.........

ColourP

Complex nominal checking domain

Colour°

MaterialP

AP

red

Material°

RelAP~~Thematic-2~~

AP

woollen

KP~~Thematic-2~~

Complex nominal functional domain

-*al*

nP

PP~~Thematic-1~~

KP~~Thematic-1~~

autumn

P°~~IN~~

(2)

(*e*)

ThematicP₂

nP

ThematicP₁

(1)

city

(1)

......NP
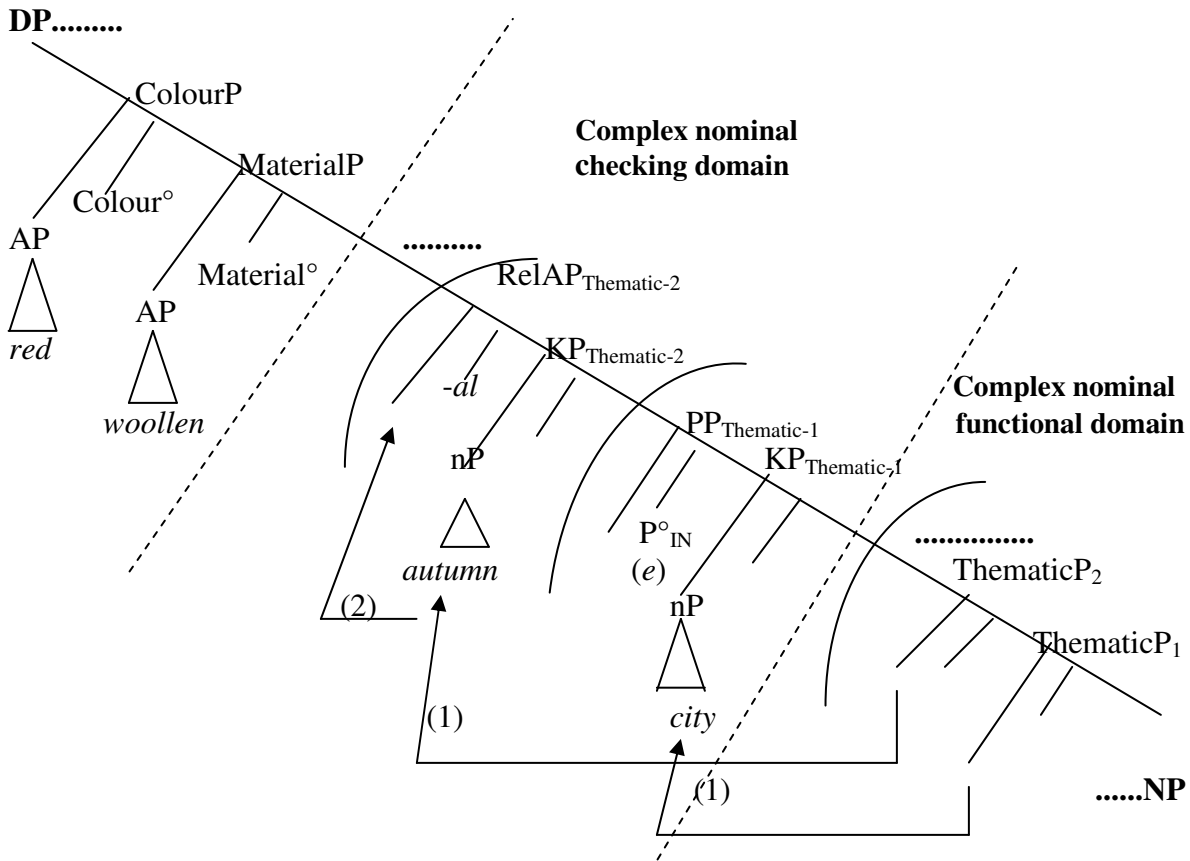
This type of analysis has the theoretical advantage of being able to account for the paraphrasing of most complex nominals with a preposition. It can furthermore draw a parallel between the formation of complex nominals in English and the corresponding structure in Romance languages where the N° is postnominally modified by a prepositional phrase (in Italian: *asciugamano da bagno* 'towel for the bathroom', *parchi di citta'* 'parks of/in the city', *pentola a pressione* 'pot that uses (with) steam – *pressure cooker*)etc.; in French: *chemin de fer* 'road of iron – *railway*'; *moulin a vent* 'mill that uses (with) wind – *windmill*' etc.). The difference between the Romance languages and English would be attributed to NP movement followed by remnant movement in the former, analogous to Schweikert's (2005) analysis of circumstantials in English above ((22-23)):

(35)   [[[**N°** [*da bagno*]] *di città*] ……]

VP….....

WP$_2$

PP$_2$

spec

P°
di

KP$_2$

Case°

nP
città

WP$_1$

spec

PP$_1$

P°
da

KP$_1$

Case°

NP

nP
bagno
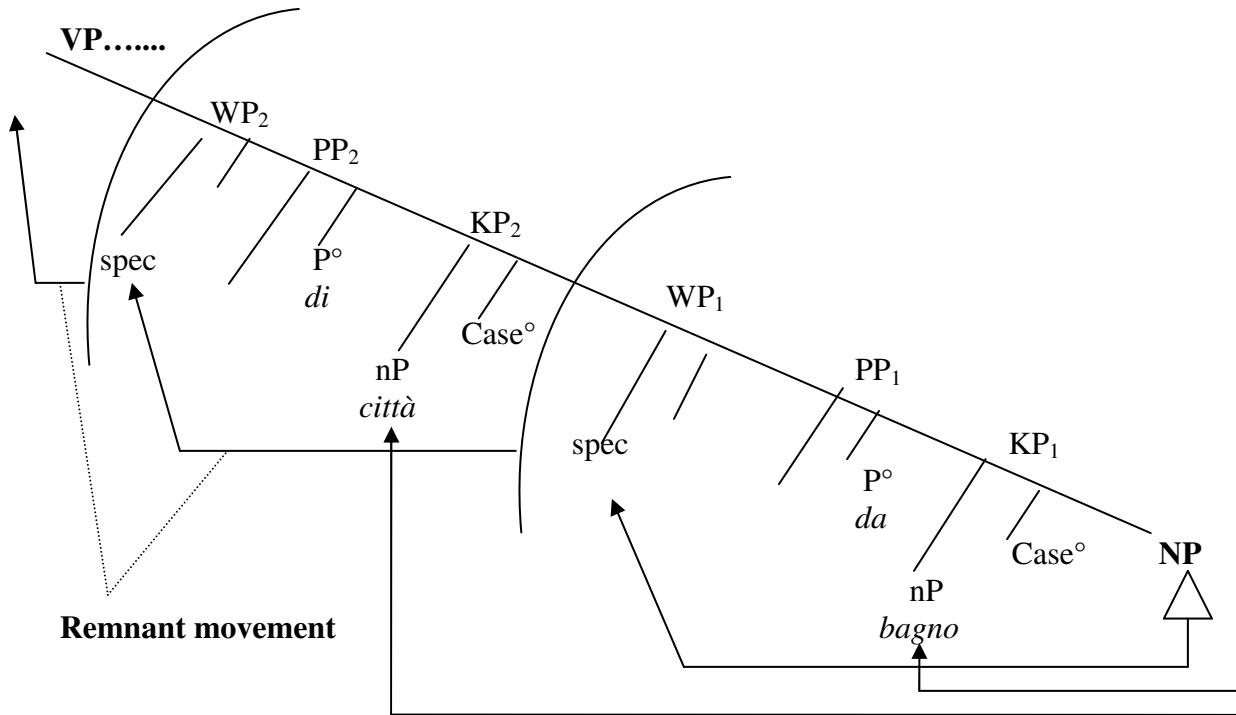
Remnant movement

In (35) above the head N° inside its NP moves to the specifier of an intermediate position (WP$_1$) which triggers remnant movement of all of WP$_1$-PP$_1$-KP$_1$ into the specifier of a higher WP, subsequent movements taking place according to how many PPs are projected in the structure:

(36)   a. …... PP-2[di città] PP-1[da bagno] NP[**N°**]$_i$ →

     b. …... PP-2[di città] NP[**N°**]$_i$ PP-1[da bagno] t$_i$ →

     c. ...... [NP[**N°**]$_i$ PP-1[da bagno] t$_i$]$_j$ PP-2[di città] t$_j$

The existence of two possibilities for modification within a complex nominal can additionally provide a structural explanation for the noted difference between relational adjectives and nouns with respect to their ability to act as the antecedent of a pronoun. That is, once the nominal modifier raises to RelAP, its amalgamation with the suffix forms an opaque structure which blocks anaphoric reference. I leave open the reason as to why ethnic adjectives allow anaphoric reference when they fill the role of 'agent' or 'theme' (Ch.2: §3). Perhaps the affix available for a referential adjective in the RelAPs whose

features correspond with the thematic roles 'agent' and 'theme' rather than lock the modifier into an opaque structure is instead transparent and allows them to retain a certain degree of 'noun-ness'. In this way, when the nP receives its suffix the base noun will still be visible to anaphoric reference[30]. We could further stipulate that the second step is obligatory for ethnic adjectives, explaining how it is that a noun may never appear in the role of 'agent' or 'theme'.

Schweikert's findings regarding the hierarchical order of circumstantials in the clause suggest that should an investigation of ordering restrictions between the semantic relations expressed by different modifiers in a complex nominal reveal this same relative hierarchy, we would have strong support for the overall structure in (34). That is, we would have reason to argue that the modifiers in complex nominals are hosted in the specifier position of distinct FPs on a parallel with the thematic FPs proposed for circumstantial PPs by Schweikert.

Analagous to the method of obtaining ordering restrictions in the cartographic approach, this can be carried out by combining two complex nominal modifiers with the same N°. For example, combining a 'temporal' modifier as in *the morning prayers* with a 'locative' modifier as in *the city prayers*, gives us two potential orders of all constituents: *the morning city prayers* or *the city morning prayers*. Where there is no ascertainable order between two semantic predicates, we could draw one of two hypotheses: a) those particular relations are not syntactic, if we presume that functional projections, and their hierarchical order, are restricted to syntax, and not available in the lexicon, or b) the pre-head constituents are of the same type (same FP). If no hierarchy emerges in general, then we have no additional evidence for claiming the syntactic status of any complex nominals. Thus, Scott's

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[30] At first glance there would seem to be some evidence against any analysis of 'source' and 'agent' as the same category. That is, anaphora is not possible within a relational adjective which seemingly expresses 'source', whereas the data in chapter 2 (§3) showed that adjectival modifiers filling the role 'agent' can be the antecedents to a pronoun.
    (i)   *This French table suggests its wood is not the best.
    (ii)   *This Colombian wool suggests its sheep are bred well.
However, given the ambiguity of *French* between the complex nominal relation 'source' and the adjective which appears in OriginP (Scott, 2002), I will not consider this data here and leave it open for future research.

'compound element' may be just that: the one pre-head position, with no indication as to whether it is morphological or syntactic.

Alternatively, it may be claimed that nothing precludes a hierarchy from existing in morphology and that any order obtained between modifiers in a complex nominal does not necessarily prove syntactic status. What is crucial here is the correlation between the semantic relations available within a complex nominal and the thematic roles found to belong to a rigid hierarchy in the syntactic domain of circumstantials. That is, both the ordering restrictions and the syntactically realised thematic relations manifested in complex nominals would provide strong support for the structure in (34), and for the general functional-specifier approach in general.

In the next chapter I will employ the above method, producing combinations of complex nominals belonging to a range of selected semantic predicates in an attempt to ascertain a hierarchical order within such constructions.

Chapter Five: *Ordering restrictions within complex nominals*

1. Introduction: methodology

My aim in this chapter is to give evidence for the syntactic status of some complex nominals by investigating the relative order of their modifiers. While it has been said that the compound criteria do not uniformly correlate to provide a unique distinction between a phrase and a compound, we saw in chapter 1 that a construction is more syntactic-like if it is end-stressed, semantically transparent, and lacks semantic specialisation. This chapter presents examples of syntactic-like complex nominals composed of a head noun and two modifiers, which, in an unmarked context, manifest ordering restrictions between the constituents.

The general format is as follows: keeping the N° as a constant, we combine pairs of complex nominals which manifest a different semantic relation between the N° and the respective modifier, thus forming two potential three-element complex nominals made up of Mod_A-Mod_B-N°, or, in semantic terms, $Relation_A$-$Relation_B$-N°. For example, we take as a base construction *autumnal 'rain* where the semantic relation between Mod and N° is TIME, and combine it with a second base construction *mountain 'rain* which manifests the relation LOCATION, constructing two potential Mod_2-Mod_1-N°s:

(1) a. *autumnal mountain 'rain* TIME > LOCATION > N°

   b. *mountain autumnal 'rain* LOCATION > TIME > N°

By providing numerous examples within each pairing of two semantic relations, in many cases a preferred ordering between the two modifying elements emerges, reflecting a preferred ordering between the two semantic relations. Assuming the transitivity rule, whereby if A precedes B and B precedes C, then A also precedes C, the resulting order between the semantic relations, reflected in the order between prenominal modifiers, is virtually identical to the order of circumstantial PPs ascertained by Schweikert (2005) and Takamine (2010). I argue that an approach such as that outlined in the previous chapter (Hierarchical Functional projections) predicts these restrictions and thus provides evidence

for the syntactic origin of the complex nominals whose elements in fact demonstrate such ordering.

This chapter is structured as follows: section 2 will reaffirm some of the assumptions I make while section 3 will then isolate the semantic relations (discussed in Ch.3) to be investigated. In section 4, by combining pairs of complex nominals, an overall hierarchy of the semantic relations will emerge, and section 5 will present the conclusions that may be drawn from the data in section 4.

2. Assumptions

The principal assumption I make in my analysis is that end-stress is only found in complex nominals which lack semantic specialisation and which do not have a classifying function (as defined in chapter 1). This is supported by the observations presented in chapter 1, and it plays a crucial role in isolating the most syntactic-like constructions. End-stress is addressed again in §2.1 while three other assumptions are presented in §2.2 - §2.4.

2.1 End-stress and the compounding effect

When combining the complex nominals there is often a tendency to stress the middle element, even between two highly transparent and end-stressed modifier patterns. Seemingly, the N° forms an internal compound with Mod_1. For example, combining (2a) with (2b) either (2c) or (2d) could be the resulting construction, both of which are acceptable:

(2)   a.   *garden 'sports*   'located in'

         b.   *evening 'sports*   'time'

         c.   *garden 'evening sports*   located in > time > N°

         d.   *evening 'garden sports*   time > located in > N°

The Mod_1+N° constituent internal to the whole construction is seen as one unit which is classified according to Mod_2. Thus in (2c) we would have '*evening sports* which are played in the garden whereas in (2d) the construction refers to '*garden sports* which are played in the evening. As predicted by the prominence relation (Liberman & Prince (1977: 257)

mentioned in Ch.1: §2.2 (17)), the resulting combination in (2c) is perhaps true lexical compounding: the fore-stressed '*evening sports* in itself is not simply 'sports played in the evening', but refers to a selected group of sports that are perhaps commonly played in the evening, that is, the construction is semantically specialised and refers to a 'type'. If, on the other hand, we assign end-stress, we can obtain the transparent meaning whereby the construction is interpreted as any sports that are played in the evening.

This tendency to construct a compound inside a three-element complex nominal is what I call here, for purely descriptive purposes, the 'Compounding Effect'. Why this happens is unfortunately beyond the scope of my research. It may be preferable from a prosodic angle, or it may prove to be strenuous on our language processing ability to maintain syntactic end-stress; that is, perhaps as a form of efficiency our language faculty prefers to classify things, rather than maintain the internal 'syntactic-like' structure.

Although the compounding effect may be the more natural way to construct a three-element complex nominal, in order for us to decipher whether some syntactic NNs do or do not exist, end-stress must be retained as it correlates with a semantically transparent interpretation. Forcing end-stress in this way is by no means ungrammatical or artificial; it is simply a way of making sure we are dealing with non-lexical items.

2.2. Listedness

The complex nominals taken as the two base constructions must not be semantically opaque or exhibit great degrees of lexical specialisation or lexicalisation, that is, they must not be compound-like NNs such as *mother ship*, *milkman*, *toothpaste*, *and brickyard*. Consequently, the resulting three-element constructions will not show any ungrammaticality of one order over the other due to pre-existing word status of one or both of the base constructions.

For example, upon investigating the relative order between 'located in' and 'for', by taking the two base constructions *toothpaste* and *kitchen paste*, we evidently get the order 'located in' > 'for' because *toothpaste is* a true lexicalised compound. Even lexicalised end-stressed

examples, such as *London fog*, may compromise the accuracy of the judgement; that is, *February London fog* may be the preferred order (cf. **London February fog*) purely because *London fog* is a well-known, potentially lexicalised, concept. While forcing end-stress already delimits the group of base-constructions to those which are generally non-lexicalised, as was discussed in chapter 1, there are a few cases of end-stressed, non-semantically specialised constructions which have maintained their end-stress. I will therefore avoid such constructions so as to obtain judgments that are as accurate as possible.

2.3 Qualitative function of relational adjectives

In many cases the relational adjective may acquire a qualitative interpretation. For example, to express that a committee is both formed to discuss finances (rather than literature for example), and its location, or institutional origin, or body, is a college (rather than a school, or an office for example), the only possible order is (3a). Example (3b) would be possible in either a descriptively financial way, that is, the *college committee* is financial in quality, its interpretation being along the lines of 'that college committee is just so "financial", not at all practical'.

(3)   a.   *college financial 'committee*

        b.   **financial college 'committee*

Naturally, (3a) is possible if the compounding effect is applied, an outcome which, as was argued above, is undesirable for the present purposes.

The qualitative reading of a relational adjective disappears if it is substituted by its corresponding noun. Throughout the analysis in section 4, where a base construction may have a relational adjective as a modifier, the N will therefore also be provided so as to isolate the relational sense of the adjective rather than the qualitative. In this way, we will additionally confirm that a relational adjective and its corresponding noun are, for the most part, interchangeable[1].

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[1] Except for ethnic adjectives and relational adjectives referring to people and countries (see §3.9).

2.4 Apparent free ordering

Where either combination seems acceptable, or a preference emerges with difficulty, it may be claimed that it all depends on how we wish to classify the construction. Consider (4)[2]:

(4)   a.   *February three-day 'event*
                     class 2   class 1   N°

          b.   *three-day February 'event*
                     class 2   class 1   N°

Where (4a) perhaps refers to only the February events of all events that last three days, (4b) picks out only the three-day events of all February events. This successive sub-specification is well noted in the literature[3] for typical classificational constructions such as (5):

(5)   a.   *Medieval French 'literature*

          b.   *French Medieval 'literature*

However, in (4a-b), the overall set of events is exactly the same, whereas the two constructions in (5a) and (5b), effectively identify two different sets of literature. That is, the semantic relation expressed between the elements in (5a) is different from those expressed in (5b). The former could be paraphrased as literature written by the French (AGENT/FROM) in the medieval period (TIME), whereas the inverse order (5b) is literature on the Medieval period (MATTER) written by the French (AGENT/FROM). The examples in (4), on the other hand, intersectively refer to those events which last three-days and which take place in February[4].

Accordingly, I therefore disregard the sub-specification claims advocated in Bosque & Picallo (1996), an implication of which is that c-adjectives/RDPs are freely ordered, and suggest that any preference in order is a valid indication or a hierarchical order between semantic relations.

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[2] I will ultimately argue that (4a) is the preferred order, although see §3.2 of this chapter for a detailed discussion on the relation MEASURE (exemplified in (4) by *three-day*).
[3] See among others Bosque & Picallo (1996) and Fábregas (2007).
[4] In fact, if the data in (4-5) were to be expressed through circumstantials in German, one might expect there to be scope differences a là Schweikert (see Ch.4: §1.2).

3. Semantic relations

The selection of semantic relations to be examined in this work has been conditioned by three main considerations. The first consideration, as has been mentioned already, was to exclude evidently lexical constructions, restricting the analysis to the most syntactic-like predicates. I therefore exclude Olsen's 'compound-internal' relations such as 'part of' and 'resembles', Liberman & Sproat's (1992) argument-predicate ("synthetic") compounds and the end-stressed Proper_name categories in Bell (2005). On the other hand we will investigate the relative order of the two relations that behave most syntactically in Bell (2005), MADE OUT OF and MEASURE and with respect to the other relations. Similarly, given Bosque & Picallo's (1996) syntactic analysis of th-adjectives, I will investigate the order of the internal argument 'theme' and the external argument 'agent' with respect to what B&P would refer to as c-adjectives, which, as was noted in chapter 3, seem to resemble Levi's RDPs.

The second consideration is the close correspondence of complex nominals to Schweikert's circumstantial PPs as was noted in the previous chapter, reiterated in (6) below. Given the syntactic nature of circumstantials, I will therefore consider complex nominals which can be paraphrased with a PP (thus excluding Levi's MAKE[5], HAVE, CAUSE, BE). However, from Schweikert's list of 14 circumstantials, I will focus only on 6.

'Evidential', 'comitative' and 'manner' will be excluded given the impossibility of a noun in the modifier position of a complex nominal as seen in the above table. While it may be the case that these thematic roles can actually exist in certain situations, for example, *the Jane thesis* or *that Jane meeting* may be acceptable where *Jane* is the last name of a famous scientist, the interpretation of 'evidential' and 'comitative' is not particularly transparent. In addition, the constructions always take fore-stress. If we were to give end-stress to *the Jane 'meeting* the interpretation would no longer be a comitative one, but instead a deverbal theme relation, 'the meeting of Jane'. This indicates that if a comitative relation were to be expressed in a complex nominal, it would be expressed through a naming function in the

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[5] Noting that many of the constructions cited as examples of MAKE$_2$ (e.g. *daisy chain*, *bronze statue*) by Levi are here represented by MADE OF. See below.

lexicon. The same observation about stress and transparency also holds for 'reason' inasmuch as the only possible interpretation of the end-stressed *the strike 'delay* (even if only partially grammatical) would be something along the lines of the ascriptive 'the delay which was a strike', thus giving us cause to exclude it from the analysis presented here.

(6)

THEMATIC ROLE	NP + [circumstantial]	Complex Nominals
Evidential	The thesis [**according to** Jane/the President]	*The *Jane/President(ial) 'thesis*
Temporal	The prayers [**in** the morning]	*The morning 'prayers*
Locative	The note [**in** the margin]	*The margin/marginal 'note*
Comitative	The meeting [**with** Jane/the President]	*The *Jane/President(ial) 'meeting*
Benefactive	The concert [**for** world-peace]	*The world-peace 'concert*
Reason	There is a delay [**because of** the strike]	*The strike 'delay*
Source	The butter [**from** the country]	*The country 'butter*
Goal	The trip [**to** London]	*The London 'trip*
Malefactive	There is a strike [**against** salary cutbacks]	*The salary cutback 'strike*
Instrumental	They gave him a wound [**with** a knife]	*The knife 'wound*
Means	The translation [**by** machine]	*The machine 'translation*
Path	The route [**through** L.A]	*The L.A 'route*
Matter	The lecture [**about** morphology]	*The morphology 'lecture*
Manner	The present wrapping [**with** love]	**The love 'present-wrapping*

The third consideration regards more the practicality of the type of analysis carried out. I initially attempted to cover as many relations as possible, only to find in many cases where relations were similar, such as 'instrumental' and 'means', there was no preference. Similar results were obtained by Schweikert (2005: 108ff.), who suggests that they may not be distinct PPs after all given their similar semantics. Moreover, Levi (1978) suggests that perhaps 'function' is the correct underlying predicate (p.92) for both 'instrument' and 'means'. I therefore merge them together under the one label, INSTRUMENT.

Similarly, when the roles 'malefactive' or 'benefactive' surface in a complex nominal, again forcing end-stress, either interpretation could be possible and an order between the two distinct relations is impossible to obtain:

(7)   a.   *world-peace salary cutback 'strike*

                              '??a strike against salary cutbacks, but for world-peace'

                              '??a strike for salary cutbacks, but against world- peace'

        b.   *salary cutback world-peace 'concert*

                              '??a concert for world-peace, but against salary cutbacks'

                              '??a concert against world-peace, but for salary cutbacks'

The examples in (7) suggest that in complex nominals lacking an explicit preposition, 'malefactive' and 'benefactive' are both categorised under the general 'purpose' label FOR.

Finally, 'goal' and 'path', both taking location modifiers, were difficult to place with respect to 'source' and 'location' and will subsequently not be considered in my analysis. For example, *France Spain journey* or *garden house passage* do not give an ordering of 'goal' with respect to 'source' but instead indicates a trip between France and Spain and the passage between the garden and the house. Additionally, 'path' is so restricted that there are only a few N°s which clearly suggest a path, namely *route* and perhaps *journey*, and end-stress is difficultly assigned: *the 'LA route* vs. *?the LA 'route*. This latter example, to me, in actual fact suggests a route 'to' LA, rather than 'path'. The same can be seen for journey: even in *the shortcut 'journey*, maintaining end-stress, where *shortcut* almost forces the idea that the journey goes through or via a shortcut, the interpretation I obtain is a journey 'to' the shortcut. One could perhaps say that a river which flows through the garden is 'path' but the resulting NN gives only the locative interpretation: *the garden 'river* = the river in the garden.

Summarising, the analysis in section 4 will investigate the relative order of the following 10 semantic categories: Bell's (2005) MADE OUT OF and MEASURE; Schweikert's (2005) 'temporal' (TIME), 'locative' (IN), 'benefactive' (FOR), 'source' (FROM) and 'matter' (MATTER); 'instrumental' (INSTRUMENT); B&P's 'theme' and 'agent'. Given the potential ambiguity of any complex nominal outlined in chapter 3 (§2), a brief description of the individual relations to be investigated is presented in §3.1 - §3.10 so as to delimit the intended semantic reference of the constructions in question.

3.1 MADE OUT OF

As was mentioned in chapter 1, MADE OUT OF is one of the few semantic categories allowing nouns as prenominal modifiers that have an entirely ascriptive function. We must, however, be careful in our definition of this relation. Constructions such as *daisy 'chain*, *apple 'pie*, *duck 'soup* etc (LEVI) appear to be a different category from MADE OUT OF inasmuch as the pre-head elements express the internal constitution of the respective N°s, rather than the principal element from which it is made. For example, a *link 'chain* is a chain made 'up' of links which can however also be defined as being made 'out' of steel. Furthermore, there is a preferred order between the two prenominal modifiers, suggesting that MADE OUT OF and MADE UP OF are indeed two different categories.

(8) a. [*steel* [*link* ['*chain*]]] $\qquad$ **link steel 'chain*
$\qquad$ N_2 $\qquad$ N_1 $\qquad$ N°

 b. [*plastic* [*apple* ['*pie*]]] $\qquad$ **apple plastic 'pie*
$\qquad$ N_2 $\qquad$ N_1 $\qquad$ N°

 c. [*chocolate* [*apple* ['*pudding*]]] $\qquad$ **apple chocolate 'pudding*
$\qquad$ N_2 $\qquad$ N_1 $\qquad$ N°

The examples in (8) show that N_1 is interpreted as the element expressing the constitution of the N° while N_2 is the material, or, in the case of (8c), *chocolate* is the overall principal ingredient. Constructions which manifest 'constitution' will therefore be excluded from my analysis and I will investigate the MADE OUT OF, or better, the 'material' category only. Furthermore, in order to keep as closely as possible to the syntactic-like examples, I exclude modifiers which refer to food products such as *chocolate*, *apple*, *lemon*, *pumpkin* etc., as they are more often than not used in lexicalised complex nominals and/or classify an N° into a type: *chocolate snack*, *apple cake*, *pumpkin pie* etc. MATERIAL modifiers are therefore: *wooden, metal, steel, paper, plastic, woollen* etc.

3.2 MEASURE

MEASURE (as discussed in Liberman & Sproat (1992) and again in Bell (2005)) expresses a relation whereby the N°, or the duration of N°, is measured by some number or measurement, for example *pound 'note, gallon 'jug, two-minute 'warning*, etc. It may be possible that this category is in actual fact two general categories: one being duration (e.g.,

two-minute '*warning*) and the other being a more literal 'numerical measure' (e.g., *gallon* '*jug*). This would seem to be preliminarily supported by the data in (9-10) which shows that both can be present in a construction, and that there is a weak relative order between the two, namely, 'duration' > 'numerical measure':

(9)   a.   How about that five-day twenty-mile 'race?

        b.   ??How about that twenty-mile five-day 'race?

(10)   a.   This is an eight-hour three-person 'activity

        b.   ??This is a three-person eight hour 'activity

In the analysis below, I will put this to the test, treating 'duration' and 'numerical measure' as two subcategories of MEASURE, MEASURE-Duration and MEASURE-Num, respectively. However, another problem arises with this category. Consider the preliminary combination of MATERIAL and MEASURE in (11):

(11)

MATERIAL	**MEAS.-Num.**	**Combinations**
steel '*bridge*	*3-metre* '*bridge*	11.1a. steel 3-metre 'bridge
		11.1b. 3-metre steel 'bridge
metal '*column*	*3-metre* '*column*	11.2a. metal 3-metre 'column
		11.2b. 3-metre metal 'column
MATERIAL	**MEAS.-Dur.**	**Combinations**
plastic '*timer*	*3-minute* '*timer*	11.3a. plastic 3-minute 'timer
		11.3b. 3-minute plastic 'timer
steel '*computer*	*3-year* '*computer*	11.4a. steel 3-year 'computer
		11.4b. 3-year steel 'computer

Both the a) and b) combinations are acceptable for all examples. However, in (11.1b) '3-metre' may in actual fact be ascriptively defining the steel bridge as being '3 metres in length'. As a consequence it may be merged into the structure outside the complex nominal at a higher level, supposedly in LengthP along with adjectives such as *long* and *short* (a là Scott 2002: 102). Similarly, (11.2b) could be paraphrased as a '3-metre high column', and

could be found in HeightP (Scott, ibid.).

Regarding MEASURE-Duration, where (11.3a) and (11.4a) are literally 'a timer that lasts 3-minutes made of plastic' and 'a computer that lasts 3-years made of steel', the MEASURE-Duration modifiers in the (b) examples seem to have a more qualitative adjectival function, perhaps also surfacing in LengthP as 'a 3-minute long timer' and 'a 3-year long computer'. This qualitative interpretation in the (b) examples is supported by a secondary reading where the MEASURE modifiers are perhaps in AgeP (Scott, ibid.), giving a '3-minute old timer' and a '3-year old computer'.   I suggest, therefore, that the true 'duration' and 'numerical measure' sense of these modifiers is maintained only in the orders MATERIAL > MEASURE-Duration and MATERIAL > MEASURE-Num, i.e., in all of the (a) examples in (11).

These two interpretations surface repeatedly, particularly with double barrelled modifiers such as *3-day*, *2-year*, *5-mile* etc., as can be seen in the combinations of MEASURE with TIME and LOCATION in (12):

(12)

MEAS.-Dur.	TIME	Combinations
five-minute 'interaction	*morning 'interaction*	12.1a. five-minute morning 'interaction
		12.1b. morning five-minute 'interaction
Three-day 'fog	*November 'fog*	12.2a. November three-day 'fog
		12.2b. Three-day November 'fog

MEASURE	LOCATION	Combinations
eight-hour 'activity	*playground 'activity*	12.3a. eight-hour playground 'activity
('duration')		12.3b. playground eight-hour 'activity
5-metre 'carpet	*bedroom 'carpet*	12.4a. 5-metre bedroom 'carpet
('numerical measure')		12.4b. bedroom 5-metre 'carpet

On the other hand, single MEASURE-Num. modifiers do not seem to spark this ambiguity:

(13)

MEAS.-Num.	MATERIAL	Combinations
litre 'container	*metal 'container*	13.1a. *litre metal 'container
		13.1b. metal litre 'container

MEAS.-Num.	LOCATION	Combinations
litre 'container	*kitchen 'container*	13.2a. *litre kitchen 'container
		13.2b. kitchen litre 'container

Referring back to the original source of the MEASURE relation, Liberman & Sproat (1992: 158), there are unfortunately only very few single MEASURE modifiers, namely, *mile run*, *pound note*, *gallon jug* and *pint jar*. These four constructions, furthermore, may be somewhat lexically specialised, and indeed have variable stress. In my analysis below, I will therefore use as base constructions the following novel (or at least less lexically specialised than those mentioned above) NNs for MEASURE-Num.: *mile race*, *litre container*, *gallon* [*boiling jug*]. For MEASURE-Dur., on the other hand, it will be necessary to employ double barrelled modifiers. I will however emphasise the 'true duration' interpretation by paraphrasing the data.

3.3 TIME

In a construction which expresses TIME, the N° must be an event, or associated with an event, for example *summer 'holiday*, *evening 'activities*, *morning 'coffee* (act of drinking coffee). If a TIME modifier is paired with an object N°, the resulting complex nominal, e.g., *summer 'fruit* or *morning 'person*, is not a clear indication of true TIME as the modifier tends to take on a classifying role as per the discussion in chapter 1, thereby defining the N° as a 'type' (a type of *fruit*, or a type of *person*). Furthermore, fore-stress is much more natural: *'summer fruit*, *'morning person*, whereas end-stress in the previous examples is easily assigned.

3.4 LOCATION

By LOCATION, we mean that the N° is located, or occurs, in/at the place referred to by the modifier. For example: *kitchen 'sink* is the sink in the kitchen, *mountain 'activities* are

activities that are carried out in the mountains*, and London 'office* is the office physically located in London. Many complex nominals with a location modifier may in fact be ambiguous, such as *kitchen 'towel* where the towel could be generally associated with the kitchen, perhaps used in the kitchen, or FOR the kitchen, or on the other hand, the towel could be physically located in the kitchen. The same is true for *hotel 'room* vs. *'hotel room*, and a *bedroom 'table* is a table simply found/located in the bedroom, we could imagine it to be a dining table or a coffee table, whereas a *'bedroom table* is a table meant for the bedroom, i.e., it could not be a dining room table, we would imagine it to be a small table that has some function in the bedroom.

In these cases, end-stress typically isolates the locative rather than the purpose relation. However, as section 3.5 will discuss, there are a number of complex nominals expressing a general FOR relation which are variably stressed. In any potentially ambiguous LOCATION complex nominal, by forcing end-stress I wish to isolate only the locative meaning.

3.5 FOR-BENEFICIARY

Complex nominals which express the relation FOR are predominantly fore-stressed. It is indeed possible to create end-stressed complex nominals of the 'purpose' category, however, they are almost always equally possible with fore-stress. This would seem to indicate our preference for constructing them in the lexicon, perhaps due to the similarity of FOR with the naming or classifying function discussed for examples such as *'Griffins biscuits* or *'art books*. Indeed, even the transparent and supposedly end-stressed *cooking 'apple* mentioned by Payne & Huddleston (2002) (see Ch.1) can easily be fore-stressed if we think of it as being a 'type' of apple. A *kitchen 'sink* on the other hand is not a type of sink.

Where there is a stronger, but by no means dominant, sense of 'transparent FOR' in the end-stressed version, the modifier refers to a beneficiary, such as *world-peace 'concert* (cf. *world- 'peace concert), charity 'event* (cf. *'charity event), avian 'sanctuary* (cf. *'avian sanctuary*), that is, the complex nominal is far less of a 'type' than *cooking apple*, *return*

ticket or *administrative office*. Given this observation, and given the scarcity of complex nominals that express the 'malefactive' sense, when considering FOR I will therefore focus specifically on the benefactive sense (henceforth, BENEFICIARY), whereby the modifier introduces an entity which benefits from the occurrence or existence of the N°.

Finally, other examples could potentially be constructions such as *student room* or *orphan home* but I have chosen to exclude them because of their tendency to evoke the genitive when end-stressed: *student's room* and *orphan's home*, where the genitive is not the true Saxon genitive but a compound genitive found in other attested compounds such as *bull's eye*, *women's clothes* etc. The number of examples used in this analysis is therefore restricted to the few mentioned above.

3.6 INSTRUMENT

In the literature (Levi (1978) in particular) INSTRUMENT (Levi's WITH) can refer to carrying out a task with or by means of an 'instrument', such as *oven 'vegetables* or *knife 'wound*, but it also covers complex nominals which express a predicate similar to 'functions with', such as *steam 'radiator*, *gas 'cooker*. Similar to FOR, there are few non-semantically specialised end-stressed complex nominals which manifest INSTRUMENT. However, end-stress is much more stable in such constructions (vis-à-vis FOR) unless the modifier is the object of some nominalisation N° (14a) or unless we specifically want to refer to the entity as a type (14b):

(14) a.   *'*steam radiator*, *'*gas cooker*   (cf. '*gas cooker* = 'cooks gas')

       b.   '*knife wound*, '*oven vegetables*

Some previous works have considered examples such as *machine translation* to be 'means', or INSTRUMENT. However, *machine translation* could be equally paraphrased as a translation carried out 'by' a machine, i.e., it could have an agentive interpretation. With a stretch of the imagination, even *oven vegetables* could have an agentive reading whereby the vegetables, in their cooked state, were produced 'by' the oven. This ambiguity disappears when an agent is present in the construction, thereby forcing an instrumental interpretation:

(15) a. *the presidential machine 'translation*
          'the translation with the machine carried out by the president'

      b. *the professorial knife 'wound*
          'the wound with a knife carried out by the professor[6]'

To avoid ambiguity where the N° is a simple noun (i.e., it lacks an explicit agent), I will focus only on the 'functions with' sense of INSTRUMENT so as to identify a true instrument. As with BENEFICIARY we are therefore limited to only a few examples: *steam 'radiator*, *gas 'cooker*, *electron 'microscope*, *coal 'incinerator*, *PowerPoint 'lecture* and *computer 'exam*. In section 4.3, however, it will be possible to adopt instrumental modifiers such as *fly* in *fly 'fishing* and *manual* in *manual 'production* in that the deverbal nominalisation is clearly carried out 'with' the modifier.

3.7 SOURCE

In chapter 3 I suggested that SOURCE and 'agent' are potentially the same category. A typical SOURCE modifier is a physical location, such as *garden* or *factory*. A typical AGENT modifier, on the other hand, refers to a person, such as *presidential* or *professorial*, or could be perhaps an instrument, as we saw for *machine translation* in §3.6 above. It must be pointed out that there seem to be two different subcategories of SOURCE (see Levi, 1978: 101-103):

(16) a. *olive / avocado / sunflower 'oil*

      b. *orange / apple/ carrot 'juice*

      c. *grain / wood 'alcohol*

(17) a. *factory / supermarket / store 'coffee*

      b. *garden / store / 'vegetables*

The constructions in (16) are composed of a modifier which denotes the source from which the N° was produced through extraction or other similar process (Levi, 1978: 102). In (17),

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[6] And not 'to the professor', as it would be if there were fore-stress: *the professorial knife wound*. This data preliminarily shows a potential order of 'agent' with respect to 'with' and 'theme'. Any conclusions on order will however be addressed in detail in the next section.

on the other hand, the modifier is locative and refers to the physical origin of the N°. The hypothesis that these are two distinct categories is weakly supported by (18) where both may occur in an end-stressed (non lexically specialised) complex nominal:

(18) a. *?factory sunflower 'oil*

     b. *?supermarket orange 'juice*

     c. *?store grain 'alcohol*

Whether or not they are two distinct categories will not be investigated further. I do choose, however, to focus solely on the constructions expressing physical origin given the ease of assigning end-stress. That is, where the examples in (16) are variably stressed for many speakers, the constructions in (17), when not referring to a specific 'type', are easily end-stressed. Agentive modifiers will be discussed in section 3.9.

3.8 MATTER

MATTER (Levi's ABOUT) behaves similarly to THEME, as was pointed out in chapter 3. This hypothesis will be confirmed through data analysis in section 4 whereby the overall linear ordering places MATTER and 'theme' in the same low position. Examples are therefore found in deverbal nominalisations where the modifier is the 'theme' projected by the underlying verb such as: *sex education, financial report*, *basket production*, or, simple N°s whose topic is embodied by the modifier: *Linguistics conference*, *finance report*.

3.9 THEMATIC MODIFIERS: AGENT and THEME

Several observations about subcategorised thematic modifiers need to be addressed. Firstly, differently from the other semantic categories discussed in this section, the relation THEME is an internal relation. It has been well documented in the literature (Bosque & Picallo (1996) following Kayne (1981) and Giorgi & Longobardi (1991), among others) that the theme of an event-denoting nominal cannot be realised as a referential adjective (see Ch.2: §3) as these adjectives express thematic roles assigned only to a specifier position. In this way, a referential adjective may only be found in a specifier position and never as a complement. B&P (p.356) suggest that all th-adjectives are mapped into a specifier position, a proposal that complements the theoretical paradigm adopted here (as

discussed in the previous chapter). If this is so, how are examples such as *financial report*, *presidential murder* ('murder of the president') and *professorial appointment* ('appointment of the professor') grammatical?

They also suggest that the thematic grid of result and object nominals does not necessarily need to be saturated and that syntactically realising their lexically licensed arguments is optional, whereas both are requirements for event nominals (p-359). That is, (19a) is ungrammatical because a referential adjective cannot fill the internal argument 'complement' role of an event nominal, nor can it be absent from an example such as (19b). On the other hand, a result nominal, not having to obey lexical requirements, does not require the complement (as per (19c)) and is thus able to license internal th-adjectives (19d).

(19) a. *the presidential professorial appointing*

b. *the presidential appointing*

c. *the presidential appointment* (...of X)
        agent

d. *the presidential professorial appointment*
        agent   theme

While a more detailed explanation of this phenomenon is perhaps required, it will not be further developed here. What is crucial is that a referential adjective which expresses THEME or MATTER may only be adopted in my analysis if the N° is a simple N° or an object or result nominal.

Secondly, many theme + deverbal nominalisation constructions have invariable fore-stress and are considered to be lexical[7], for example, the synthetic *–er* compounds such as *taxi driver* and *stone cutter*. Others, however, may take end-stress and importantly give a transparent interpretation, such as *basket 'production*, where it is the 'act or result of producing baskets' that is referred to, or *whale 'fishing* where we do not mean the type of fishing that is "whale fishing", but the 'act or result of fishing whales'. In this way, we

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[7] See Ch.1: fn.9.

have a more syntactic-like construction with regards to our compound criteria. Thus, as for all semantic categories, end-stress will be forced with our relation THEME so as to identify the potential syntactic status of such constructions. Notably, the deverbal nominalisation will be either an event-denoting or a result-denoting nominal, the former precluding a referential adjective from appearing as theme (re: §3.8 above).

Another issue of note is that referential adjectives in the role of 'theme' or 'agent' in a complex nominal must always be expressed with a relational adjective; that is, the corresponding noun is ungrammatical (as was also seen in Ch.2: §3):

(20)   a.   *presidential 'visit*, *professorial 'appointment*

       b.   **president 'visit*, *professor 'appointment*

       c.   *the president's 'visit*, *the professor's 'appointment*

As (20) shows, in order for this class of noun to be permitted in modifier position it must be genitive, and presumably moved higher up in the DP. A noun would be allowed in this case only if it were truly classifying, for example, *'the 'pope visit' was much more interesting than the "forest visit'*, in which case the construction is clearly lexical (given fore-stress and its classifying function discussed in chapter 1).

Finally, as has been alluded to in previous discussions, both 'theme' and 'agent' are expressed by the same relational (referential) adjective. Thus even though there may be some logical preference based on our encyclopaedic knowledge, a RelAN construction whose N° is a result-denoting nominal may be ambiguous, as can be noted in (21)[8]:

(21)   a.   *papal 'murder*
              'the murder by the pope' (AGENT), 'the murder of the pope' (THEME)

       b.   *professorial 'visit*
              'the visit by the professor' (AGENT), 'the visit to the professor' (THEME)

       c.   *presidential 'debate*
              'the debate by the president' (AGENT),'the debate on the president' (THEME)

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[8] See Giegerich (2005: 12ff).

Ambiguity disappears once there are two modifiers where the relative order of 'theme' and 'agent', as was discussed in chapter 3 (§3), is AGENT > THEME > N°:

(22)

THEME/MATTER	AGENT	Combinations
legal 'debate	*presidential 'debate*	22.1a. *legal presidential 'debate
		22.1b. presidential legal 'debate
morphology 'debate	*papal 'debate*	22.2a. *morphology papal debate
		22.2b. papal morphology debate
language 'production	*Japanese 'production*	22.3a. *language Japanese production
		22.3b. Japanese language production

Aside from their potential to surface as either the theme or the agent, a referential adjective can additionally be interpreted as the possessor:

(23)   a.   *the presidential basket production*
             'the production of baskets by the president/belonging to the president'

       b.   *the professorial finance 'report*
             'the report on finance carried out by the professor/belonging to the professor'

As was pointed out in chapter 3, we can construct a complex nominal headed by a deverbal N° which is both result and event-denoting where the higher modifier is interpreted as the possessor and the lower modifier as the agent (24a, b), or the source (24c):

(24)

       a.   *the papal presidential basket production*
                 poss.   agent
             'the production of baskets by the president belonging to the pope'

       b.   *the parliamentary professorial finance report*
                 poss.   agent
             'the report on finance carried out by the professor belonging to parliament'

       c.   *the presidential* [*factory* [*production of shellfish*]]
                 poss.   source
             'the production of shellfish from the factory belonging to the president'

Thus, there are potentially three ways an adjective such as *presidential* can be read: as AGENT, as THEME or as a possessor. The ambiguity unfortunately does not end there. Referential adjectives which specifically refer to ethnicity ('ethnic adjectives'), as well as appearing in the role of agent/source or possessor, can surface in two additional positions, namely in Nationality/OriginP (Scott, 2002: 102) and as the modifier of a complex nominal expressing the relation IN. Consider (25) and (26)[9]:

(25) a.   *the   interesting   Indian   finance report*
                                   agent/source/location

      b.   *the interesting Indian   Pakistani   finance report*
                          location   agent/source

      c.   *the British (Britain's) interesting Indian   Pakistani   finance report*
           poss.   location   agent/source
        'An interesting finance report carried out <u>by Pakistan</u> (from Pakistan)
        <u>located in India</u> (now) <u>belonging to Britain</u>'

(26) a.   *the Japanese fugitive*
          location   ('the fugitive located in Japan')

      b.   *the   French   Japanese fugitive*
          nationality location ('the fugitive located in Japan of French nationality)

      c.   *the British (Britain's) dangerous French   Japanese fugitive*
         poss.   nationality   location
        'the dangerous fugitive <u>located in Japan</u>, <u>belonging to Britain</u>, of <u>French
        nationality</u>'

      d.   *the British (Britain's) dangerous French   Japanese Chinese fugitive*
           poss.   nationality   location source
        'the dangerous fugitive who escaped <u>from China</u>, <u>located in Japan</u>, of <u>French nationality</u> who now <u>belongs to Britain</u>'

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[9] In the literature the AP which typically hosts the ethnic adjectives has been referred to as both NationalityP and OriginP. While it is not my aim to develop this category any further, it must be pointed out here that a difference emerges with respect to which of the two an ethnic adjective may refer to when used in a sentence simultaneously with 'source/agent'. That is, it is semantically impossible to create a construction that refers to both the origin and the source, given that they are almost identical in meaning. The same goes for 'origin' and 'agent' inasmuch as 'origin' is so semantically similar to 'source' that the same impossibility of 'source' and 'agent' appearing together emerges again (cf. Ch.3: §3). On the other hand, it is possible for 'nationality' and 'source' to appear in the same phrase, as is demonstrated in (26) here.

The data in (25c) and (26c-d) above, despite the interpretive burden, show that there are at least four distinct positions for ethnic adjectives. The fifth position, 'theme', is restricted to strictly object-denoting or result-denoting nominals (as per the discussion in §3.8 above). Consequently, if we force a result interpretation of certain deverbal N°s, we get (27) and (28)[10]:

(27)   The <u>Russian</u> (*Russia's*) *prosperous <u>American</u> winter <u>Korean</u> 'production*
                ($relA_5$)   ($relA_4$)   ($relA_1$)
                                                                          (.... *lasted a good five years*)

'the prosperous production of Korea(n people) in winter, the place of origin (of the production) being America, which (now) belongs to Russia.....lasted a good five years'

(28)   The <u>British</u> *interesting winter <u>Indian</u> <u>Pakistani</u> <u>American</u> 'report*
                ($relA_5$)   ($relA_3$)   ($relA_2$)   ($relA_1$)
                                                                          (.....*showed positive results*)

'the interesting report on America(ns) carried out by Pakistan(i) in winter, located in India, which (now) belongs to Britain......showed positive results'

While it is difficult to imagine the production of people in (27), considering both (27) and (28) I believe it is nonetheless possible to display all five positions available to the ethnic adjectives.

Given the five-way ambiguity of ethnic adjectives, I will generally avoid using them in my analysis unless it can be shown that the order is unambiguous. Any order whereby an example such as *French* precedes another semantic category could simply reflect the order Nationality/OriginP > 'compound element'. However, where a semantic category found in complex nominals precedes an ethnic adjective, the latter must express 'source' or 'location'. Referential adjectives which refer to public figures or institutions, on the other hand, will be included, although their intended interpretation will be paraphrased in case of any ambiguity.

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[10] In order to show all five positions in the one sentence we would need a N° which can take a theme and be of a nationality. Semantically, this seems impossible, hence why I give both (27) and (28).

3.10 Summary

Based on the above arguments, the 10 semantic relations whose relative orders will be investigated here are given in (29) . For each relation the table provides a paraphrase which highlights the intended meaning, and an example of the complex nominal to be used as a base construction (with a single modifier).

(29)

SEMANTIC RELATION	NP + paraphrase	Complex Nominals
MATERIAL	*The clothes are made of cotton*	*The cotton 'clothes*
MEASURE-Duration MEASURE-Num	*The timer lasts three minutes* *The container is one litre (in size)*	*The 3-minute 'timer* *The litre 'container*
TIME ('Temporal')	*The prayers in the morning*	*The morning 'prayers*
LOCATION ('Locative')	*The riots in the city*	*The city 'riots*
BENEFICIARY ('Benefactive')	*The concert for world-peace*	*The world-peace 'concert*
SOURCE ('Source')	*The butter from the country*	*The country 'butter*
INSTRUMENT ('Instrumental')	*The cooker with steam* *They fish with a fly*	*The steam 'cooker* *The fly 'fishing*
MATTER ('Matter')	*The lecture on morphology*	*The morphology 'lecture*
THEME	*The production of baskets*	*The basket 'production*
AGENT	*The production by the Japanese*	*The Japanese 'production*

The overall hierarchy obtained through the ordering restrictions that emerge in the next section is given in (30):

(30)   MATERIAL > TIME > LOCATION > AGENT/SOURCE > BENEFICIARY > MEASURE-Num/-Duration > INSTRUMENT > THEME/MATTER > N°

The aim of section 4 is to show step-by-step how the order in (30) was obtained, while some conclusions will be drawn in section 5 regarding the theoretical implications of such a hierarchy.

4. The analysis: Combining complex nominals[11]

For descriptional purposes I start in section 4.1 with the highest categories, namely TIME, LOCATION and MATERIAL, taking a simple noun as N°. Departing from the order of the relations established in §4.1, section 4.2 proceeds to argue for the relative positions of BENEFICIARY, INSTRUMENT, SOURCE, MEASURE and MATTER, again with a simple N°. Finally, in section 4.3, I produce constructions with a deverbal N° that identify the positions of THEME and AGENT, confirming their placement in the same position as MATTER and SOURCE, respectively.

The judgements on ungrammaticality are not always very clear-cut. In some cases, the order between the modifiers to me seems evident, although there are many cases which may be questionable for other speakers. The judgements are all mine and all rely on maintaining end-stress, which, again, may be odd or even ungrammatical for others.

4.1 MATERIAL, TIME, LOCATION

The first set of examples shows the relative ordering between MATERIAL and LOCATION.

(31)

MATERIAL	LOCATION	Combinations
plastic 'sink	*kitchen* 'sink	31.1a. plastic kitchen 'sink
		31.1b. *kitchen plastic 'sink
metal 'floor	*bedroom* 'floor	31.2a. metal bedroom 'floor
		31.2b. *bedroom metal 'floor
wooden 'barn	*mountain* 'barn	31.3a. wooden mountain 'barn
(*wood* 'barn)		(wood mountain 'barn)
		31.3b. *mountain wooden 'barn
		(*mountain wood 'barn)

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[11] The examples used as base constructions are taken from a variety of studies, all of which have been discussed in earlier chapters. Any other examples are my own.

fibre-glass 'bus   city 'bus   31.4a. fibre-glass city 'bus

                                          31.4b. *city fibre-glass 'bus

The (a) examples are all preferred over the (b) examples. Confirming that a RelAN and its corresponding NN are to be treated equally, if we substitute *wooden* with its corresponding noun, *wood*, maintaining of course the end-stress, (31.3a) is still preferred over (31.3b). If *wood village* is fore-stressed, ambiguity arises whereby a *wood village* seems to be a specific village where wood is made, or from where wood is purchased, i.e., it is a classifying, and lexical, construction. A similar discussion can be had for *city bus*. If it has fore-stress the interpretation is ambiguous and could be anything 'associated' with the city: a bus that comes from the city, is used for transport within the city, etc. I believe that forcing end-stress forces the specific 'bus LOCATED IN the city' interpretation. Hence, I conclude that the order is MATERIAL > LOCATION.

In (32) below, comparing TIME and LOCATION, there is a recognisable preference for the a) examples:

(32)

TIME	LOCATION	Combinations
summer 'rain	*urban 'rain*	32.1a. summer urban 'rain
	(*city 'rain*)	(summer city 'rain)
		32.1b. *urban summer 'rain
		(*city summer 'rain)
autumnal 'rain	*London 'rain*	32.2a. autumnal London 'rain
(*autumn 'rain*)		(autumn London 'rain)
		32.2b. *London autumnal rain
		(*London autumn 'rain)
summer 'holiday	*beach 'holiday*	32.3a. summer beach 'holiday
		32.3b. *beach summer 'holiday
November 'fog	*London 'fog*	32.4a. November London 'fog
		32.4b. *London November 'fog

The ordering restrictions here strongly suggest that TIME precedes LOCATION. We again confirm the equal treatment of relational adjectives and nouns in light of example (32.1a) where the order N>RelA>N° is possible. I additionally point out that the RelA-N° constituent in (32.1a) has not undergone the compounding effect, neither is it in any way semantically specialised, end-stress remaining. Furthermore, both *London 'fog* and *November 'rain* may be somewhat lexicalised (although not lexically specialised, cf. Ch.1: §2.2), nonetheless, *November 'rain* is split by the insertion of the location modifier *London*.

Nouns which refer to events are impossibly 'made out of' anything; thus it is difficult to obtain a relative order between MATERIAL and TIME as in order to express the latter we need an event, or phenomenon. Intuitively I would expect MATERIAL to be higher up given its ascriptive and entirely syntactic function. With some stretch of the imagination, however, we can obtain (35):

(35)

MATERIAL	TIME	Combinations
plastic 'rain	*February 'rain*	35.1a. plastic February 'rain
		35.1b. *February plastic 'rain
concrete 'snack	*morning 'snack*	35.2a. concrete morning 'snack
		35.2b. *morning concrete 'snack

Based on the data in (31) – (35), I argue for the order MATERIAL > TIME > LOCATION.

4.2 BENEFICIARY, MEASURE, INSTRUMENT, SOURCE, MATTER

Appealing to transitivity, in order to show that any of the remaining relations are placed lower than those exemplified in 4.1, we need only combine them with LOCATION. Let us start with BENEFICIARY.

(36)

LOCATION	BENEFICIARY	Combinations
London 'event	*charity 'event*	36.1a. London charity 'event
		36.1b. *charity London 'event

garden 'sanctuary	*avian 'sanctuary*	36.2a. garden avian 'sanctuary
	bird 'sanctuary	36.2b.garden bird 'sanctuary
		36.3a. *avian garden 'sanctuary
		36.3b. *bird garden 'sanctuary
Berlin 'concert	*world-peace 'concert*	36.4a. Berlin world-peace 'concert
		36.4b. *world-peace Berlin 'concert

As was stated in the previous section, examples were difficult to find as most general 'purpose' complex nominals take fore-stress, however with the data I have given, there is a clear preference for LOCATION > BENEFICIARY. Both categories of MEASURE are also lower than LOCATION as shown in (37).

(37)

MEAS.-Num	**LOCATION**	**Combinations**
litre 'container	*kitchen 'container*	37.1a. *litre kitchen 'container
		37.1b. kitchen litre 'container
mile 'race	*lake 'race*	37.2a. *mile lake 'race
		37.2b. lake mile 'race
gallon 'boiling jug	*kitchen 'boiling jug*	37.3a. *gallon kitchen 'boiling jug
		37.3b. kitchen gallon 'boiling jug

MEAS.-Dur.	**LOCATION**	**Combinations**
3-minute 'timer	*kitchen 'timer*	37.4a. *3-minute kitchen 'timer
		'3 minute long 'timer loc. in the kitchen'
		37.4b. kitchen 3-minute 'timer
		'timer that lasts 3 minutes loc. in the kitchen'
3-year 'computer	*study 'computer*	37.5a. *3-year study 'computer
		'3 year long computer loc. in the study'
		37.5b. study 3-year 'computer
		'computer that lasts 3 years loc. in the study'

Keeping in mind the ascriptive interpretation of *3-minute* and *3-year* obtained when in a higher LengthP, as discussed in detail in section 3.2, all (a) examples in (37) are

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ungrammatical, suggesting the order LOCATION > MEASURE.

The relative order between BENEFICIARY and MEASURE is shown in (38).

(38)

BENEFICIARY	MEAS.-Num.	Combinations
charity 'container	*litre 'container*	38.1a. charity litre 'container
		38.1b. *litre charity 'container
charity 'boiling jug	*gallon 'boiling jug*	38.2a. charity gallon 'boiling jug
		38.2b. *gallon charity 'boiling jug
charity 'race	*mile 'race*	38.3a. charity mile 'race
		38.3b. *mile charity 'race

BENEFICIARY	MEAS.-Dur.	Combinations
charity 'event	*3-day 'event*	38.4a. charity 3-day 'event
		'event that lasts 3 days for charity'
		38.4b. *3-day charity 'event
		'3-day long event for charity'
world-peace 'concert	*3-hour 'concert*	38.5a. world-peace 3-hour 'concert
		concert that lasts 3 hours for world-peace
		38.5b. *3-hour world-peace 'concert
		3-hour long concert for world-peace

The base constructions manifesting BENEFICIARY in (38) are fairly unnatural as we usually think of *charity* involved with some event, such as in (38.4). However, we can perhaps imagine a container that was made especially for charity, or a boiling jug which has been donated to charity, for example. Overall, the (a) examples are preferred over the (b) examples for the combination of BENEFICIARY and MEASURE-Num. The ambiguity of a higher qualitative MEASURE phrase clearly emerges in the MEASURE-Dur. examples. Following the discussion in section 3.2 of this chapter, however, I exclude the readings in the (b) examples. As was the case in (37) above, there is no difference in ordering between MEASURE-Duration and MEASURE-Num with respect to BENEFICIARY. The resulting

order is therefore LOCATION > BENEFICIARY > MEASURE. The next relation to place is SOURCE, which as (39) shows, is at least above MEASURE.

(39)

MEASURE_Num	SOURCE	Combinations
litre 'container	*factory 'container*	39.1a. *litre factory 'container
	'a container produced by a factory, i.e., not hand-made'	39.1b. factory litre 'container
gallon 'boiling jug	*supermarket 'boiling jug*	39.2a.*gallon supermarket 'boiling jug
	'a boiling jug purchased at a supermarket'	39.2b. supermarket gallon 'boiling jug

MEASURE-Dur.	SOURCE	Combinations
3-minute 'timer	*supermarket 'timer*	36.3a. *3-minute supermarket 'timer
	'a boiling jug purchased at a supermarket, i.e., origin is a supermarket'	'3-minute long-lasting timer from a supermarket' 39.3b. supermarket 3-minute 'timer 'timer that lasts 3 minutes from a supermarket'
3-year 'computer	*factory 'computer*	39.4a. *3-year factory 'computer
	'a container produced by a factory, i.e., not hand-made'	'3-year long-lasting computer from a factory' 39.4b. factory 3-year 'computer 'computer that lasts 3 years from a factory'

Given the noted tendency for NNs expressing SOURCE to be categorised as types (see also Ch.1: §2.2.1), and consequently fore-stressed, I have given some hopefully disambiguating paraphrasing. These end-stressed examples, at least for me, are transparent and indicate place of origin in the modifier. As is by now familiar, I exclude (36.3a) and (36.4a) given the qualitative interpretation associated, and no difference between the two subcategories of MEASURE emerges.

The data in (40) weakly suggest that SOURCE is positioned higher than BENEFICIARY; subsequently, due to transitivity, also higher than MEASURE.

(40)

SOURCE	BENEFICIARY	Combinations
factory 'coffee	*charity 'coffee*	40.1a. ?factory charity 'coffee
'coffee produced by a factory vis-à-vis at home'	'coffee produced for charity'	40.1b. ?charity factory 'coffee
garden 'vegetables	*charity 'vegetables*	40.2.a. ?garden charity 'vegetables
'vegetables that come from the garden'	'vegetables destined for charity'	40.2b. ?charity garden 'vegetables

The data here is uncertain. However, if we accept the observation in chapter 3 that SOURCE is perhaps the same category as AGENT, the analysis of AGENT in §4.3 will confirm the order AGENT > BENEFICIARY, and by default we would obtain SOURCE > BENEFICIARY. If we then attempt the combination of SOURCE and LOCATION, it is also difficult to interpret it; however, with detailed contextual paraphrasing, I argue for the order LOCATION > SOURCE:

(41)

SOURCE	LOCATION
canteen 'sandwich	*school 'sandwich*

"Yesterday while at school I had a sandwich from the canteen"

    (41.1a) **canteen school 'sandwich*

        "*having a *canteen school 'sandwich* is convenient"

        '*having a sandwich at school from the canteen is convenient'

    (41.1b) *school canteen 'sandwich*

        "having a *school canteen 'sandwich* is convenient"

        'having a sandwich from the canteen at school is convenient'

SOURCE   LOCATION

garden 'vegetables   *kitchen 'vegetables*

"Those vegetables in the kitchen are from the garden but the ones in the pantry are from the supermarket."

      (41.2a) *garden kitchen 'vegetables*

            "*we will eat the *garden kitchen 'vegetables* for dinner tonight."

            '*we will eat the vegetables located in the kitchen from the garden tonight'

      (41.2b) *kitchen garden 'vegetables*

            "we will eat the *kitchen garden 'vegetables* for dinner tonight"

            'we will eat the vegetables from the garden located in the kitchen tonight'

The final two relations to be dealt with in this section are MATTER and INSTRUMENT. Preferences between INSTRUMENT and MEASURE-Num are difficult, although I believe the a) examples are slightly better formed. The order between INSTRUMENT and MEASURE-Duration, on the other hand, is clear; the (b) examples are ungrammatical:

(42)

MEASURE-Num	INSTRUMENT	Combinations
gallon 'boiling jug	*steam 'boiling jug*	42.1a. ?gallon steam 'boiling jug
	'boiling jug that functions using steam'	42.1b. ??steam gallon 'boiling jug
litre 'cooker	*steam 'cooker*	42.2a. ?litre steam 'cooker
'a cooker whose capacity is one litre'		42.2b. ??steam litre 'cooker

MEASURE-Dur.	INSTRUMENT	Combinations
3-minute 'cooker	*steam 'cooker*	42.3a. 3-minute steam 'cooker
		42.3b. *steam 3-minute 'cooker
3-year 'incinerator	*coal 'incinerator*	42.4a. 3-year coal 'incinerator
		42.4b. *coal 3-year 'incinerator

3-minute 'lecture	*PowerPoint 'lecture*	42.5a. 3-minute PowerPoint 'lecture
	'a lecture that functions using PowerPoint'	42.6a. *PowerPoint 3-minute 'lecture
3-hour 'exam	*computer 'exam*	42.6b. 3-hour computer 'exam
	'an exam that functions using a computer'	*computer 3-hour 'exam

From the data in (42) I would tentatively suggest that MEASURE precedes INSTRUMENT. The evidence is not strong, however, as the (a) examples may only be correct because of the qualitative reading possible if the modifier is situated in LengthP. The ungrammaticality of the (b) examples, could furthermore be attributed to the impossibility of inserting material between the modifier and N° of these particular constructions. However, (43) below will show that the elements in the same INSTRUMENT base constructions, when paired with MATTER can in fact be separated, thereby indirectly supporting the order obtained in (42) above.

(43)

MATTER	**INSTRUMENT**	**Combinations**
morphology 'lecture (morphological 'lecture)	*PowerPoint 'lecture* 'a lecture that functions using PowerPoint'	43.1a. *morphology PowerPoint 'lecture (*morphological PowerPoint 'lecture) 43.1b. PowerPoint morphology 'lecture (PowerPoint morphological 'lecture)
finance 'exam (financial 'exam)	*computer 'exam* 'an exam that functions using a computer'	43.2a. *finance computer 'exam (*financial computer 'exam) 43.2b. computer finance 'exam (computer financial 'exam)

The data in (43) shows MATTER to be the lowest positioned relation, adjacent to the N°, despite the data being limited, given the difficulty of finding a N° that can both 'function using' an instrument and have a topic matter. I would finally like to note that the N°s *lecture* and *exam* may project some underlying argument structure, similar to thematic

nominals, whereby there could potentially be an agent who carries out the lecture or the exam, as seen in (44):

(44)   a.   *the presidential PowerPoint morphology lecture*

'the lecture on morphology with PowerPoint by the president'

b.   *the professorial computer finance exam*

'the exam(-ination) on finance with a computer by the professor'

I do not believe, however, that this observation compromises the ordering restrictions presented in (43) inasmuch as it is clear that the modifiers in the base constructions expressing INSTRUMENT (*PowerPoint* and *computer*) are indeed instrumental and not SOURCE, for example (re: the discussion in §3.6 above).

Recapitulating, the semantic relations investigated above with respect to a simple N°, display ordering restrictions between them. Through transitivity, the resulting hierarchy is:

(45)   MATERIAL > TIME > LOCATION > ?SOURCE/?BENEFICIARY >
        MEASURE-Num/Duration > INSTRUMENT > MATTER

The next section will present similar combinations of deverbal complex nominals in order to show the relative ordering of THEME and AGENT with respect to (45).

4.3 THEME, AGENT

The base constructions for THEME which take a noun as modifier may take fore-stress, and can possibly be argued as being complement-head constructions, formed in the lexicon. However, as I have stressed throughout, here I focus on any end-stressed versions in the hope of identifying the most syntactic-like structures, that is, those whose modifier can be licensed as the theme in a specifier position (re: the discussion in §3.9).

If, as was discussed earlier, THEME is the same category as MATTER, we would expect any modifier expressing the theme of a deverbal nominalisation to be adjacent to the N°. This is confirmed in (46):

(46)

INSTRUMENT	THEME	Combinations
manual 'production	*basket 'production*	46.1a. manual basket 'production
'production of X with hands'		46.1b. *basket manual 'production
fly 'fishing	*trout 'fishing*	46.2a. fly trout 'fishing
'fishing carried out with a fly'		46.2b. *trout fly 'fishing
computer 'fishing	*whale 'fishing*	46.3a. computer whale 'fishing
'fishing carried out with a computer'		46.3b. *whale computer 'fishing
knife 'carving	*tree 'carving*	46.4a. knife tree 'carving
		46.4b. *tree knife 'carving

The modifier in the INSTRUMENT base constructions could again perhaps be argued to be the 'agent' and not a real 'instrumental' modifier, however, the data in (47) shows that an agent may additionally be present in all of the (a) examples above.

(47)

INSTRUMENT	AGENT	Combinations
manual basket 'production	*papal basket 'production*	47.1a. papal manual basket 'production
		47.1b. *manual papal basket 'production
fly trout 'fishing	*professorial trout 'fishing*	47.2a. Japanese fly trout 'fishing
		47.2b. *fly Japanese trout 'fishing
computer whale 'fishing	*professorial whale 'fishing*	47.3a. professorial computer whale 'fishing
		47.3b.*computer professorial whale 'fishing
knife tree 'carving	*presidential tree 'carving*	47.4a. presidential knife tree 'carving
		47.4b. *knife presidential 'carving

We can therefore conclude that THEME and MATTER are likely to be the same category, given the reasons discussed in chapter 3, and furthermore due to the data in (43) and (46)

above which position both relations adjacent to the N° and lower than INSTRUMENT[12].

As per the data in earlier sections, a modifier referring to the agent of a deverbal nominalisation may be considered to belong to the same category as SOURCE. In §4.2 we failed to find convincing evidence for any order between SOURCE and BENEFICIARY; the examples in (48), however, show that AGENT precedes BENEFICIARY. If we therefore maintain the hypothesis that AGENT and SOURCE are the one category, we now have evidence for the order SOURCE/AGENT > BENEFICIARY.

(48)

BENEFICIARY	**AGENT**	**Combinations**
charity food 'production	*presidential food 'production* 'food production carried out by the president'	48.1a. *charity presidential food 'production 48.1b. presidential charity food 'production 'food production for charity carried out by the president'
charity tree 'carving	*parliamentary tree 'carving* 'tree carving carried out by the parliament'	48.2a. *charity parliamentary tree 'carving 48.2b. parliamentary charity tree 'carving 'tree carving for world-peace by the parliament'
world-peace trout 'fishing	*papal whale 'fishing* 'trout fishing carried out by the Pope'	48.3a. *world-peace papal trout 'fishing 48.3b. papal world-peace trout 'fishing 'trout fishing for world-peace by the Pope'

To confirm that the referential adjectives in the role of agent in (48) above, (49) shows that TIME precedes AGENT, as it does so for SOURCE. This would not be expected if a referential adjective were either possessive or in OriginP (relevant for ethnic adjectives, cf. the discussion in §3.9)

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[12] So far, the results obtained here go against the claims in B&P, and suggests that in English, modifiers with the THEME relation (th-adjectives in Spanish) are closer to the N° than the relations represented by c-adjectives in Spanish, such as INSTRUMENT, TIME etc. This will be discussed further in Ch.6: §3.1.

(49)

TIME	AGENT	Combinations
Winter food 'production	*Japanese food 'production* 'food production by the Japanese'	49.1a. Winter Japanese food 'production 49.1b. *Japanese winter food 'production
Summer tree 'carving	*presidential tree 'carving* 'tree 'carving by the president'	49.2a. Summer presidential tree 'carving 49.2b. *Presidential summer tree 'carving
afternoon 'visitors	*Chinese 'visitors* 'the Chinese who visit'	49.3a. afternoon Chinese 'visitors 49.3b. *Chinese afternoon 'visitors

While *Japanese* and *Chinese* could be expressing LOCATION, as can be seen in (50), AGENT is also positioned lower than LOCATION, as was SOURCE in (41) above.

(50)

LOCATION	AGENT	Combinations
London 'elections	*presidential 'elections* (*...of her staff*)	50.1a. London presidential 'elections 50.1b. *presidential London 'elections
office 'debate	*clerical 'debate*	50.2a. office clerical 'debate 50.2b. *clerical office 'debate
city food 'production	*Japanese food 'production*	50.3a. city Japanese food 'production 50.3b.*Japanese city food 'production

Considering the data in (47) to (50), the position of AGENT therefore appears to be between LOCATION and BENEFICIARY.

5. Conclusions regarding the hierarchy of modifiers in complex nominals

The overall order of English prenominal modifiers manifested in complex nominals obtained in the present work reflects the order of circumstantial PPs obtained by Schweikert (2005) for German (the mirror image order of which is found in English) and by Takamine (2010) for Japanese, with only one exception emerging in each case. The relative order of the 10 semantic predicates that have been examined here can be

summarised in (51), while Schweikert's hierarchy is reiterated in (52) and Takamine's[13] in (53) (citing the relevant relations only).

(51)   **MATERIAL > TIME > LOCATION** > AGENT/**SOURCE > BENEFICIARY >** MEASURE-Num/-Dur. **> INSTRUMENT** > THEME/**MATTER** > N°

(52)   [**Temporal** *on Sunday* [**Locative** *on the table* [**Benefactive** *for his wife* [**Source** *from Munich* [**Instrumental** *with a knife* [**Matter** *about mathematics* > V°

(53)   [**Temporal** *on Sunday* [**Locative** *in the backyard* [**Source** *from the roof* [**Instrumental** *with an ax* [**Material** *of rice* > V°

The relative order between TIME, LOCATION, SOURCE and INSTRUMENT is the same in all three hierarchies. Also in the same relative position in (51) and (52) – below INSTRUMENT – is MATTER, a PP not present in (53). BENEFICIARY and SOURCE, however, appear to be inverted when comparing the present data in (51) and Schweikert's (2005) order of circumstantials in (52). Additionally, the position of MATERIAL in Takamine's (2010) hierarchy is within the lowest domain, whereas the analysis in the present work shows it to be the highest of all relations investigated. We will discuss possible explanations for these apparent divergences in chapter 6.

Furthermore, I have shown that there is syntactic support for treating the relations AGENT and SOURCE as belonging to the same category, similarly to THEME and MATTER, given that they surface in the same position relative to the other semantic relations analysed.

The existence of the hierarchy in (51) within the domain of complex nominals, taken alone, does not necessarily confirm the syntactic status of such constructions. That is, the order of relations may reflect the logical classificational system available in true lexical compounding in the morphological component of the lexicon. However, as was discussed

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[13] The examples cited for each circumstantial are taken from Takamine (2010: 52-53)

in chapter 4 (§5), the relations manifested in complex nominals reflect the thematic relations shown elsewhere to conform to a rigid syntactic hierarchy. This observation together with the outcome of the data analysis above (§4), which produced a hierarchy of modifiers within complex nominals that is virtually identical to that of the said thematic relations, gives a much stronger case for these complex nominals as syntactic constructions.

Returning to the theoretical paradigm outlined in chapter 4, we now have strong support for a syntactic structure along the lines of that proposed by Schweikert for circumstantials, whereby the modifiers of complex nominals are base-generated/merged in the specifiers of unique functional projections as a nP. The nP subsequently raises to a higher KP in order to check its thematic features from where it optionally raises to RelAP in order to receive any available adjectival suffix. If the nP instead remains in spec, KP, an empty P° is inserted into the RelAP so as to license the nominal modifier.

(54)   RelAP-Temp[*nocturnal* NP-Loc[*college* RelAP [*morphological* N*lecture*]

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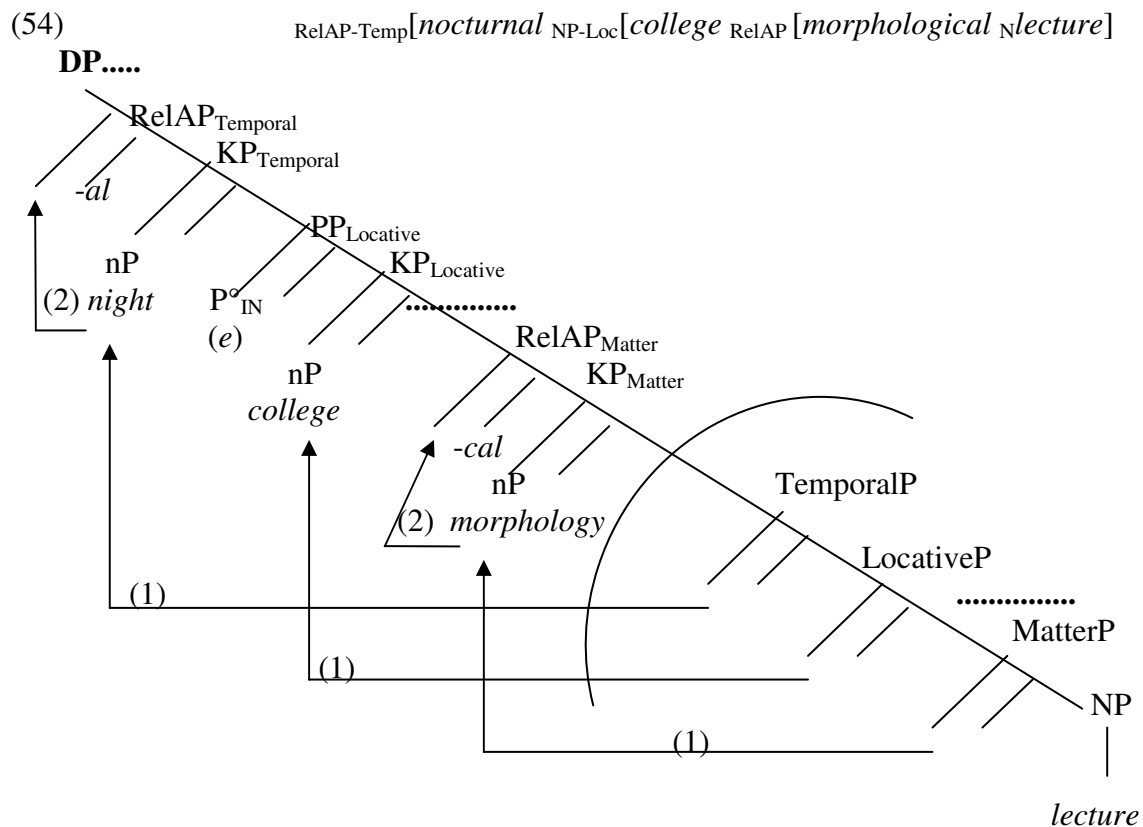
The structure in (54) has the theoretical advantage of being able to account for a rigid hierarchy of modifiers obtained through observations on ordering restrictions, and can accurately embody the parallel between the domain of circumstantials and that of complex nominals. It furthermore accounts for the 'syntactic' recursiveness of NN-stacking inasmuch as any noun may project a number of FPs into which another noun may be merged.

Chapter Six: *Implications and limitations*

In the previous chapter I argued that the hierarchical order established between the modifiers of end-stressed, non-semantically specialised complex nominals in English strongly suggests that such constructions are syntactic considering that a near identical hierarchy has been shown to exist in the clausal syntactic domain of circumstantials in German and Japanese. In what follows I briefly discuss some limitations of my analysis (§1), as well as the differences that emerged between the hierarchies proposed by Schweikert (2005) and Takamine (2010) and the hierarchy motivated in the present work (in §2). Finally, some implications of the claims made here will be presented in section 3.

1. Limitations

For many, the end-stressed examples I adopt as base constructions in the analysis in chapter 5 will either be ungrammatical, or will not perhaps have the interpretation I assign to them. For example, as was mentioned in chapter 1 (§2.2), Giegerich (2004: 8) claims that certain constructions which are usually fore-stressed take on the MATERIAL interpretation if end-stressed (see Ch.1 §2.2 (1)):

(1)   a.   *tear 'gas*   "gas made of tears"

      b.   *hair 'net*   "net made of hair"

      c.   *hair 'oil*   "oil made of hair"

Contrastingly, I have worked with the assumption that interpretations other than MATERIAL are available in many end-stressed complex nominals, and that furthermore, these constructions are syntactic. The principal observation motivating my claim is that end-stress generally correlates with semantic transparency and lack of semantic specialisation, and is only assigned in syntax. Thus, while many complex nominals I use in my analysis are clearly end-stressed (see (2) below) and non-semantically specialised, there are others which may be questionable for many speakers; specifically, where I have assigned end-stress to a construction which for some may be variably stressed, or even typically fore-stressed. The resulting Mod_2-Mod_1-$N°$ combinations may therefore be considered ungrammatical for those who do not accept

the end-stressed base constructions and the resulting order may consequently be seen as incorrect, or even irrelevant.

However, clearly end-stressed (or at least variably stressed) constructions for all of the relations examined here do exist, as can be seen in (2):

(2) MATERIAL: *plastic 'sink*; *metal 'floor*

  LOCATION: *kitchen 'sink*, *bedroom 'floor*

  TIME: *February 'fog*; *summer 'holiday*

  SOURCE: *factory 'coffee*; *garden 'vegetables*

  AGENT: *presidential 'visit*; *papal 'debate*

  BENEFICIARY: *cooking 'apple*; *charity 'event*

  INSTRUMENT: *steam 'radiator*, *gas 'cooker*

  MEASURE: *mile 'race*; *litre 'container*

  MATTER: *morphology 'lecture*; *finance 'exam*

  THEME: *language 'production*; *papal 'appointment*

Should my observation regarding syntactic-like constructions (generally end-stressed and non-semantically specialised) prove to be well-grounded, the possibility of interpreting end-stressed constructions such as *milk 'bottle* as a bottle 'for' milk, and *hair 'oil* as oil 'located in' the hair, for instance, is supported. Furthermore, the overall result indirectly provides evidence for my assumptions, given that the hierarchy obtained is reflected in other syntactic domains.   That is, if end-stressed non-semantically specialised modifiers in complex nominals display the same ordering restrictions as circumstantials, we have reason to believe that any syntactic complex nominal will be end-stressed and will lack semantic specialisation.

However, even if we do wish to accept that a construction is most-syntactic like if it is end-stressed and lacks semantic specialisation, another related problem emerges: for many semantic categories there are very few potential modifiers. For example, in combinations involving BENEFICIARY only *charity* and *world-peace* were adopted, as were only *mile*, *gallon* and *litre* for MEASURE etc. Therefore, my hierarchy in some places is based on very restricted data. Here, perhaps a corpus-based approach could be integrated so as to identify all naturally occurring end-stressed complex nominals.

2. Divergent hierarchies

As was noted in the previous chapter, the hierarchy of modifiers in complex nominals obtained here diverges from those advanced by Schweikert (2005) with regards to one relative order, namely, that between BENEFICIARY and SOURCE. In actual fact, the order between these two relations was very difficult to ascertain (see Ch.5 (40)), and the evidence for claiming the order of SOURCE > BENEFICIARY was based on my suggestion that AGENT and SOURCE were one and the same category.

In keeping with the overall desire to obtain a universal hierarchy within the cartographic framework (and indeed within generative grammar), it could be that combining the categories AGENT and SOURCE into one is incorrect and that BENEFICIARY is actually positioned between the two, given that I found no preference between SOURCE and BENEFICIARY. Alternatively, the data in chapter 5 (example (48)) which argues for the order AGENT > BENEFICIARY may be for some reason wrong. However, the judgements are particularly clear and I see no valid reason to exclude only this set of data as ad hoc. It seems that a larger set of complex nominal data and further research are required.

There is also a difference between the hierarchy presented here and that proposed by Takamine (2010). Where the ordering restrictions in the present work showed MATERIAL to be the highest category of all, in her analysis of Japanese, Takamine (2010) showed that the 'material' circumstantial came after 'instrumental' and preceding only 'manner' with respect to the verb. The difference between BENEFICIARY and SOURCE outlined above could perhaps be attributed to difficulties in distinguishing any ordering restriction between two relations positioned close to each other; the extreme divergence between Takamine's (2010) positioning of MATERIAL and the present one, however, is unexpected. However, on a closer examination of the exact examples that Takamine (2010) uses, this unexpected difference may be explained.

The PPs which express 'material' investigated by Takamine (2010) are generally involved in a constitutive relation with the noun, rather than a strict MATERIAL interpretation (as per the discussion in Ch.5: §3.1). For example:

(3) a. Taro-ga   sake-o   kome-kara tsukuru
         Taro-NOM sake-ACC   rice-MAT   make

     'Taro makes sake from rice.' (p.53)

     b. Taro-ga   [Material ringo-kara] aisu-o   tsukuri-tsuzuketa.
         Taro-NOM   apple-MAT   ice.cream-ACC   make-continued

     'Taro continued to make ice cream from apples.' (p.126)

     c. Taro-ga   [Material konbu-kara]   dashi-o   tsukuri-oe-ta.
         Taro-NOM   seaweed-MAT   soup.stock-ACC   make-complete-past

     'Taro completed to make soup stock from seaweeds.' (p.126)

If expressed as complex nominals, the data in (3a-c) would not have been considered under MATERIAL in the present analysis due to the interpretation being more one of MADE UP OF. Alternatively they may be perhaps comparable to a potential sub-category of SOURCE exemplified by *olive 'oil* and *grain 'alcohol* where the N° is 'extracted from' the modifier (see Ch.5: §3.7). Although I chose not to include either of these relations in my analysis because of potential for lexicalisation and fore-stress, MADE UP OF did seem to be closer to the N° than MATERIAL, as was shown in chapter 5. Indeed, if what Takamine (2010) refers to as 'material' is in fact MADE UP OF, the difference between the two hierarchies is accounted for. Moreover, given Takamine's (2010) data, we may even be able to predict the positioning of whichever relation it might be (out of the constitutive MADE UP OF or the 'extracted from' SOURCE) within the present hierarchy:

(4)   MATERIAL > TIME > LOCATION > AGENT/SOURCE > BENEFICIARY > MEASURE-Num/-Dur. > INSTRUMENT > **?MADE UP OF/SOURCE-extracted** > THEME/MATTER > **?MADE UP OF/SOURCE-extracted** > N°

One of her examples where the 'material' PP seems to be a true 'material' in the sense I have referred to here, is given in (5) below. In this example, the PP 'from Origami papers', if interpreted with respect to the verb, might in actual fact have an instrumental reading or it may be expressing the 'source' if there is indeed a subcategory which refers to the extraction process in particular:

(5)   Taro-wa   [Loc ie-de]   [Mat orikami-de]   senbazuru-o   orimashita.
        Taro-TOP home-LOC   paper-MAT   crane-ACC   folded

        'Taro folded cranes from origami papers at home.' (p.185)

Following Scott (2002), MATERIAL (as we intend it here) is actually considered an AP, which perhaps belongs outside of any complex nominal domain. I would therefore stipulate that, differently from the other categories that have been investigated in Takamine (2010), Schweikert (2005) or in the present work, the thematic relations which are present in a VP (mirrored in complex nominals) do not include MATERIAL. What Takamine (2010) refers to as 'material' PP may in fact be filling a thematic role such as a secondary 'source'. It is not my intention to draw any conclusions about Takamine's (2010) data, but I do believe there is good reason to consider her 'material' different from the one analysed here.

3. Implications

In this section I discuss the implications of the findings in chapter 5 with regards to Bosque & Picallo's (1996) analysis of relational adjectives and Pustejovsky's (1991) qualia structure. In addition, the hierarchy of FPs established in the present work would suggest that upon a cross-linguistic examination we might expect to find morphemes which correspond to the functional heads encoding the relations we find within complex nominals, namely LOCATION, TIME, WITH, etc. In section 3.3 I refer briefly to some data in Sadock (1998) which could confirm such an application. Finally, in light of the present findings, some implications regarding the fuzzy boundary that divides morphology and syntax will also be addressed.

3.1 Bosque & Picallo (1996): c-adjectives and th-adjectives revisited

According to the data in B&P (1996), a classificational adjective (c-adjective) should be closer to the N° than a thematic adjective (th-adjective) (see Ch.3: §3 and the work itself (pp.367-369)). In English, the order would therefore be the mirror image.

While it is not explicit in their work, they suggest (p.361-362) that c-adjectives resemble thematic roles. Thus, as was pointed out in chapter 3, c-adjectives in Spanish would be used to express the relations we have investigated here. That is, th-adjectives

are our THEME and AGENT, while relations such as INSTRUMENT, BENEFICIARY, SOURCE, TIME, LOCATION and MATTER may be considered to come under the label c-adjective. If this were the case, and I wish to point out that I am not assuming this given their inexplicit reference to the matter, the hierarchy obtained here would seem to contradict their claims.

In (6) below we see that, in English, as predicted by the hierarchy of modifiers in complex nominals, not only are c-adjectives not adjacent to the noun, but neither c-adjectives nor th-adjectives appear to be one homogenous group in terms of the hierarchical order.

(6)   MATERIAL > TIME > LOCATION > AGENT/SOURCE > BENEFICIARY >
        c-adj > **c-adj**   > **th-adj** **c-adj** >   **c-adj**   >

        MEASURE-Num/-Dur. > INSTRUMENT > THEME/MATTER > N°
        c-adj   >   **th-adj**   **c-adj** > **N°**

Although I have argued for AGENT, SOURCE, THEME and MATTER as belonging to only two categories, I will consider them for argument's sake to be distinct, without hazarding any assumption as to their order relative to each other. Consequently, the relative order of th-adjectives and c-adjectives as predicted by the hierarchy obtained here either places THEME closest to the N°, rather than a c-adjective as is claimed by B&P, or places THEME above MATTER (a c-adjective), but below INSTRUMENT (another c-adjective) In addition, the remaining relations that may be considered to be c-adjectives are split into two groups on either side of the AGENT, another th-adjective. In the upper part of the hierarchy we have TIME and LOCATION and between AGENT and THEME we find BENEFICIARY and INSTRUMENT.

However, looking closer at their data which demonstrated that c-adjectives are closer to the N° than th-adjectives in both English and Spanish, the c-adjectives exemplified would only cover three of the semantic relations discussed here[1]: MATTER (*religious war*, *european politics*, *agrarian politics* pp.368-369), TIME (*periodical analyses* p.369), and INSTRUMENT (*manual basket production* p.367). In particular, the MATTER examples are all discussed with respect to the agentive th-adjective, and

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[1] Citing only the English translations, for the original data, see Bosque & Picallo (1996).

therefore the order AGENT > MATTER would in fact hold. The example *periodical analyses* is given to show the order between AGENT and TIME (B&P, 1992: 369):

(7)   *unos   analisis periodicos gubernamentales absurdos*

        an   analysis   periodical governmental   absurd

        'some absurd periodical analyses by the government'

B&P show that the order in Spanish, based on this example, would be N° > TIME > AGENT. Their analysis also claims that the order in English is the mirror image, or, AGENT > TIME > N°. According to the hierarchy obtained here, however, the English complex nominal would be *some absurd periodical governmental analyses*, that is TIME > AGENT > N°. This same inversion is found in the one example of INSTRUMENT:

(8)   *una producción manual cestera*

        a   production   manual   basket-Ø

        'a manual basket production'

That is, the order in Spanish is N° > INSTRUMENT > THEME, whereas in English the order in this example, and indeed according to our hierarchy of modifiers in complex nominals, is INSTRUMENT > THEME > N°.

Given that there are only these few examples, and considering that B&P do not explicitly label their c-adjectives in terms of thematic relations, an in-depth investigation into postnominal adjectival modification in Spanish would be needed in order to draw a fair comparison between the order proposed by B&P and that proposed here.

3.2 Pustejovsky's (1991) qualia structure

According to Fábregas (2007), the three qualia that can be expressed by a modifier in a compound are (see also Ch.1: §2.1.2):

(9)   (i)   its origin   e.g., *bullet hole*   (agentive quale)

        (ii)   its function or purpose   e.g., *bread knife*   (telic quale)

        (iii)   its components   e.g., *silicon breast*   (constitutive quale)

Turning to our hypothesis regarding Takamine's (2010) analysis of PPs, namely, that modifiers which express 'constitution' are potentially placed lower than INSTRUMENT in our hierarchy (see (4) above), the three roles of a noun's qualia structure available to a compound are all located in the lower part of the hierarchy.

As will be discussed in section 3.4, there seems to be a structural and behavioural difference between TIME and LOCATION as one set of relations, and BENEFICIARY, SOURCE, INSTRUMENT, MEASURE and MATTER as another. Notably, the qualia structure are all represented in this second set, that is, the set which is closer to the N°. This is perhaps expected considering that the qualia structure makes up a part of the inherent functions available to a noun.

3.3 Implications of a hierarchy of FPs within complex nominals

In line with the work carried out within the functional-specifier approach (cf. Ch.4: §1) the existence of a range of FPs in the domain of complex nominals implies that the functional heads of such projections may potentially be overtly filled with functional morphemes and suffixes corresponding to the semantic specifications encoded in the F°. This hypothesis may in fact be supported by data from West Greenlandic, a language which relies on derivational suffixes in order to form new word forms. Interestingly, certain suffixes are employed in order to express many of the relations discussed in the present work, as can be seen in (10) below (data taken from Sadock (1998: 170).

(10)

Relation	**Affix**	**Meaning**
material	*-taq*	'the part of it made of__'
location	*-mioq*	'one who dwells in __'
purpose	*-niut*	'device for catching__'

While a more thorough investigation of West Greenlandic would certainly be required in order to come to any grounded claims, under the analysis outlined here, the affixes in (10) could be generated in the functional head of the functional projection corresponding to each unique relation, into whose specifier the base noun would then raise in order to receive the suffix in F°. I do not wish to stipulate any further as to the potential applications of my analysis, but the data in (10) does suggest that an investigation of languages which manifest functional morphemes (such as those

discussed in Cinque (1999), for example – cf. Ch.4: §1.1) may provide additional support for the approach advocated here.

3.4 Some general conclusions regarding the 'fuzzy boundary'

The scope of my dissertation was not to define a lexical compound per se, but to investigate the syntactic nature of the constructions which lie on the fuzzy boundary between morphology and syntax. However, in order to do so it was necessary to make some assumptions regarding what distinguishes a lexical item from a phrasal construction.

Through an investigation of the compound criteria, I proposed a continuum of phrasal/compound-like behavioural features whereby some complex nominals behave much like lexical constructions whereas others conform to only one or two of the criteria, and some do not behave like compounds at all. Regarding lexical constructions in particular, I have argued that fore-stress is available only in the lexicon. It would therefore appear as if there is a highly productive faction of morphology that produces classifying constructions whereby an entity is signalled as being a set of a larger group of N° through fore-stress ('*Griffins biscuits*, '*art books* etc.), and a less productive component which relies heavily on our individual knowledge of the construction as a whole ('*mother ship*, '*buttercup*, etc.). Complex nominals are most syntactic-like, on the other hand, if they conform to one or more of: end-stress, lack of semantic specialisation, *One*-substitution and other constituent tests.

Moreover, in mapping this continuum onto the hierarchy of semantic relations within complex nominals, there seems to be some correlation. Indeed, it would appear that the higher up the relation is in the hierarchy, the more likely we are to find end-stressed and non semantically specialised complex nominals. To illustrate, end-stress is common with complex nominals that manifest the semantic predicates TIME, LOCATION and MATERIAL, while BENEFICIARY, SOURCE, INSTRUMENT and MATTER have a tendency to take fore-stress as the most natural stress pattern.

At first glance, this observation does not hold for MEASURE. However, we saw in section 3.2 of the previous chapter that many of the modifiers that have been discussed

under the label MEASURE may in fact belong to APs positioned higher up in Scott's (2002) hierarchy. In fact, the few examples taken to be true MEASURE constructions were all variably stressed, as was the case for BENEFICIARY, SOURCE, INSTRUMENT and MATTER.

As was stated above, the fact that there are complex nominals manifesting these semantic predicates which can be end-stressed suggests that such relations are available to syntax. However, many fore-stressed complex nominals express the same relation between the elements, indicating that these rules of combination are potentially also available to word formation in morphology, i.e., compounding. In particular, classifying structures are predominantly constructions which manifest the general purpose relation FOR. Thus, if these same relations are also morphological configurations, it may be that the lower part of the syntactic hierarchy is now almost redundant, potentially explaining the difficulty in finding end-stressed complex nominals whose inter-elemental relation is one of this lower set of semantic categories.

In conclusion, the 'fuzzy boundary' is seemingly still fuzzy, a distinct line between morphology and syntax appearing more as a continuum of compound or phrase-like qualities. However, the data presented here confirms that there is indeed a syntactic construction site for many complex nominals, namely, those whose modifiers fill a thematic role with respect to the N°.

Conclusions and Final Remarks

As is common place within the cartographic approach, the work carried out here sought to ascertain the underlying order of syntactic constituents through observations on ordering restrictions. I specifically focused on modifiers in the domain of complex nominals, and provided evidence for an array of functional projections corresponding to the semantic relations (mostly thematic) that are manifested in such constructions.

Given that many complex nominals have often been considered (lexical) compounds, I first examined the compound criteria proposed in the literature so as to establish some distinction between syntactic phrasal modifiers and the pre-head constituent of compounds. Syntactic constructions were shown to be consistently end-stressed and non-semantically specialised, manifesting a transparent relation between their elements which is typically paraphrased by a preposition. By combining two modifiers which express these syntactic relations with the head noun we saw that out of the two possible constructions (Mod_A–Mod_B–$N°$ and Mod_B–Mod_A–$N°$) the order of the modifiers in one construction is preferred over the other. By applying the principle of transitivity, an overall hierarchy emerges from these ordering restrictions.

Interestingly, this hierarchy of semantic relations is reflected in the clausal domain of circumstantials proposed in works such as Schweikert (2005) and Takamine (2010), confirming the syntactic status of the complex nominals investigated. It furthermore suggests that the syntax is indeed a potential construction site for both NNs and RelANs and that many compounds may in actual fact be syntactic in origin, even if they have acquired some lexical qualities through lexicalisation.

Ordering restrictions can be structurally accounted for by the functional-specifier approach adopted within the cartographic framework inasmuch as it predicts that any rigid surface order reflects an underlying hierarchy whereby each constituent is base-generated in a unique position. As has been similarly shown for adverbs (Cinque, 1999), adjectives (Scott, 2002) and circumstantials (Schweikert, 2005; Takamine, 2010), I claim here that the modifiers of complex nominals are located in the specifier position of a unique FP whose features encoded in the $F°$ semantically correspond with the modifier in question.

I have argued that there are two potential ways in which a modifier in a complex nominal may be licensed. All modifiers of complex nominals start out as nouns (nPs) but may subsequently raise to a higher projection (RelAP) in order to receive any available relational suffix. The amalgamation of the nP and its suffix forms an opaque constituent which becomes invisible to anaphora. The other option is for the nP to remain in KP, consequently surfacing as a nominal modifier, where it will be licensed by the insertion of an empty P°. In this way we can account for the only difference between relational adjectives and nouns noted here: where a nominal modifier will allow anaphoric reference, pronouns are unable to refer to relational adjectives.

The correlation of the hierarchy obtained here with those obtained elsewhere in the literature strongly suggests that the ordering restrictions between certain semantic relations may in fact hold in many other languages. Future research into the types of suffixes and functional morphemes that exist cross-linguistically could not only provide us with further insight into the hierarchy of functional projections within complex nominals, but may additionally result in the emergence of this hierarchy within other syntactic domains.

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