

RESEARCH ARTICLE

Attributive adjective ordering and the complement-modifier distinction

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Received: 18 October 2024; **Revised:** 12 August 2025; **Accepted:** 07 August 2025

Abstract

In this paper, we present two corpus-based case studies which cast doubt on the postulation of a distinction between complements and modifiers in pre-head position in the English noun phrase. Based on examples such as *medical student*, the paper focuses on ordering patterns as an easily observable criterion, rather than more difficult or less reliable criteria such as anaphoric replacement or stress patterns. The conclusion is that the pre-head dependents treated as complements in, for example, the Cambridge Grammar of the English Language (Huddleston & Pullum et al. 2002), should rather be treated as type-dependents. This conclusion, at least as far as ordering patterns are concerned, is in line with the postulation of a “classifier” function in approaches to English noun phrases such as Feist (2009).

1. Introduction

A characteristic feature of the vast majority of structural analyses of English noun-phrases, dating back at least as far as Lees (1960), is a syntactic distinction between complementation and modification. The existence of a class of relational nouns whose arguments correspond to syntactic complements is also a widely accepted postulate in formal semantics (e.g. Partee & Borschev 2012). Nevertheless, doubt has on occasions been cast on whether such a distinction can be sustained, either at a syntactic or a semantic level (e.g. Keizer 2004, Keizer 2011, Portero Muñoz 2013, Payne et al. 2013).

In contemporary non-*CGEL* frameworks we also observe moves compatible with our proposal. Within the LFG/HPSG traditions, Przepiórkowski (2016a,b) collapses the complement/adjunct distinction as a structural primitive and differentiates argument status via independent constraints; our “Type” analysis aligns with that architecture inside the noun phrase. In Distributed Morphology, compounding and head movement have been argued to derive certain pre-nominal sequences (Harley 2009). Ordering facts and coordination diagnostics are compatible with limited lexicalized compounds but militate against treating the *associative* A–N and N–N cases at issue here as the output of head movement: the

observed **lability** of pre-head dependents and the availability of internal coordination are unexpected under a uniform incorporation account but follow if these are type/classifier dependents within a composite nominal, that is, a syntactic construction rather than a compound.

Attributive adjectives are, for the most part, given their optionality, treated as modifiers rather than complements. However, in one class of examples such as those in (1a), the adjective appears to express a thematic argument of the predicate denoted by the head noun:

1. a. electrical supply/archaeological student/presidential advisor
 b. electricity supply/archaeology student/*president advisor
 c. supply of electricity/student of archaeology/advisor of/to the president

In this class, there is typically (but not always, see **president advisor*) a semantically or derivationally related noun which occurs in a similar pre-head position forming a composite nominal, as in (1b), and the relation is also expressible by a complement-like post-head PP, as in (1c). Giegerich (2006) calls such adjectives ‘associative’ as opposed to ‘ascriptive’, and the syntactic description of Payne & Huddleston (2002) in the noun phrase chapter of *The Cambridge Grammar of the English Language* (Huddleston and Pullum et al. 2002, henceforth CGEL), treats them as complements of the noun by virtue of the apparently relational nature of the construction.

In this paper, we present corpus-based case studies of these ‘complement-like’ adjectival pre-head dependents. Using nominalisations such as those in (1), we argue that the thematic status of the adjective does not correlate with the syntactic properties claimed for NP-internal complements, in particular their expected adjacency to the head noun.

In section 2, we discuss the rationale behind the postulation of a complement-modifier distinction in noun phrase structure analogous to the prior complement-modifier distinction claimed for verb phrase structure, and its subsequent persistence. This is followed in section 3 by a more detailed discussion of the rationale for treating pre-head adjectives such as those in (1a) as complements. Section 4, the central section, then presents two corpus-based case studies which cast doubt on the relevance of a pre-head complement-modifier distinction in an account of pre-head dependents in the English noun phrase. In its place, an analysis seems preferable in which pre-head dependents are treated as structurally identical, with their relative order determined on a semantic basis. In the determination of order, this analysis has close affinities with functional approaches to nominal pre-head ordering dating back to Halliday (1985) and exemplified in later work by Feist (2009), Ghesquiere (2014) and Davidse and Breban (2019). In the conclusion, we discuss the data presented here in the light of previous arguments weakening the case for a complement-modifier distinction more generally.

2. The complement-modifier distinction in noun phrase structure

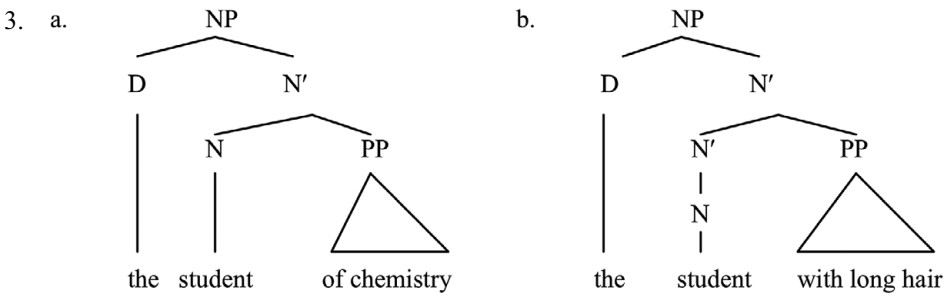
The possibility of a distinction between complements and modifiers in the English noun phrase dates to generative discussions of the parallelisms between clause structure and nominalizations (e.g. Lees 1960). In conjunction with the earlier and widely accepted notion that verb classes are to be distinguished in terms of complementation (e.g. Jespersen 1933), the search for parallelism led to the postulation of a corresponding complementation system

for deverbal nouns. This system was then quickly extended to nouns more generally (Chomsky 1970, Baker 1979).

The supposed parallelisms between verb and noun phrase complementation, and the distinction between complements and adjuncts, were enshrined in structural terms in the X-bar theory of syntax (Jackendoff 1977). Initially the complement-modifier distinction was applied to post-head dependents. Thus, the deverbal noun *student* was analysed as taking a complement PP in examples such as (2a) where this PP corresponded to the direct object of the underlying verb *study*, but as simply being modified by the PP in (2b) where it did not:

2. a. the student of chemistry
- b. the student with long hair

The well-known X-bar structural representation (3) of this distinction relied on the postulation of an N' node which would immediately dominate both the head noun and the complement, as in *student of chemistry*. The complement would then be a sister of the head noun, represented by the lexical category N. On the other hand, modifiers such as *with long hair* in *student with long hair* would be introduced as sisters of the N' node, allowing for recursion of N' and a potential multiplicity of modifiers as opposed to the typical licensing of just a single complement:



Various further arguments in favour of such a structural differentiation were proposed, notably the claim that complements (unless heavy and extraposed) would automatically be forced to occur adjacent to the head noun and precede any modifiers. By far the most natural order would be complement—modifier, as in (4a), rather than modifier—complement, as in (4b):

4. a. the [N' [N student] of chemistry]] with long hair
- b. ??the student with long hair of chemistry

An unnatural order such as that in (4b) would have to be analysed as a case of extraposition, conflicting with the non-heavy nature of the complement. Also prominent is the claim that the pro-form *one* ('anaphoric' or 'substitute' *one*) acts as a substitute for the N -bar node, not the N node, and cannot therefore be substituted for a head noun alone preceding a complement, that is, we cannot substitute *one* for *student* in the structure in (3a), whereas this substitution is possible in (3b).

The extension of the X-bar schema to a distinction between complements and modifiers in noun-phrase-internal pre-head position appears to be due to Radford (1988). In example

(5a), the pre-head dependent *English*, denoting nationality, would be an adjectival modifier, whereas in (5b), denoting the language, it would be a complement and a noun, corresponding in verb-phrase structure to the direct object in *teach English*, as well as to the post-head PP complement of *English* in (5c).

5. a. the [_A English] teacher – modifier
- b. the [_N English] teacher – complement
- c. the teacher [_{PP} of English] – complement

In pre-head position, the complement noun would be forced to be adjacent to the noun, so that the interpretation of (6) would have to be one in which the first occurrence of *English* denoted nationality, and the second the language:

6. the [_A English] [_{N'} [_N English] [_N teacher]]

The reliability of order as an argument for a structural distinction between complements and modifiers is the topic of the discussion below.

In a parallel development in the formal semantic literature, the analysis of nominalizations as having an argument structure like that of clauses (Grimshaw 1990) quickly extended to the postulation of a more general class of so-called relational nouns. Thus a verb such as *study* would be represented semantically as in (7a), taking two arguments, an agent and a theme. The theme argument would correspond at the syntactic level to the direct object of *study*, i.e. its verbal complement, and this treatment naturally extended to assigning thematic status to the PP complement of deverbal nouns such as *student*, represented as in (7b):

7. a. [study' <agent, theme>]
- b. [student' <theme>]

For the theme argument, there would thus be a one-to-one correspondence between semantic argument status and syntactic complement status, fortifying the distinction between complements and modifiers at a structural level.

The class of relational nouns is widely considered to encompass not just deverbal nouns, but also a wide range of basic nouns which conceptually involve a related entity, for example, nouns such as *brother*, *friend*, *king*, *leg* and *edge*.¹ These are semantically assigned thematic arguments in the same way as deverbal nouns like *student*, and the thematic argument would correspond structurally to a post-head complement PP, e.g. *edge of the table*. The correspondence should presumably also apply to the syntactic status of a pre-head nominal such as *table* in *table edge*, a point to which we will also return.

3. Pre-head adjectives as complements

Within approaches that distinguish between modifiers and complements, attributive adjectives are, for the most part, treated as modifiers rather than complements. However, in one

¹ See DeBruin & Scha (1988) and Barker (1995, 2011). As a reviewer points out, the origins of this idea are earlier than the development of formal semantics and date back to at least Fillmore (1968).

class of examples such as those in (8a), the adjective appears to express the theme argument of the predicate denoted by the head noun:²

8. a. electrical supply/cardiac massage/financial advisor
 b. electricity supply/heart massage/finance advisor
 c. supply of electricity/massage of the heart/advisor on finance

In a detailed study of noun dependents, Giegerich (2006) distinguishes these as a subset of ‘associative’ as opposed to ‘ascriptive’ adjectives.

The adjective *electrical* as a dependent of the head noun *supply* in (8a) (see also *archaeological* as a dependent of *student* in the introductory set of examples in (1)), represents the straightforward case where the adjective is a transparent derivative of a noun which seemingly represents a thematic argument and which, as shown in (8b), can likewise appear as a pre-head dependent with little if any difference in meaning. The adjective *cardiac* as a dependent of *massage* in (8a) differs solely in the fact that it is not a transparent derivative, but semantically corresponds in the same way to *heart* in (8b) and (8c). The head noun *advisor*, which also featured in (1), is more complex in that the verb *advise* of which it is an agent nominalisation has two apparent non-agent arguments which can be represented adjectivally. In (1), in the case of *presidential advisor*, we have the verb phrase *advise the president* and nominalisation *advisor of/to the president* in which *the president* is treatable as a theme or recipient. On the other hand, in (8a) the adjective *financial* appears to represent a second non-agent argument, corresponding to the apparently subcategorised PP *on finance* in the verb phrase *advise (x) on finance*.

In terms of their ordering, these nouns and their related adjectives are subject to similar sequencing effects:

9. a. constant electricity supply
 b. ??electricity constant supply
10. a. constant electrical supply
 b. ??electrical constant supply

Payne & Huddleston (2002) also point to a second class of adjectives which looks in some ways similar to those in (8) and consists of cases such as those illustrated in (11):

11. a. ecological expert/ecology expert/expert in ecology
 b. criminal lawyer/crime lawyer
 c. legal secretary/law secretary

The obvious difference is that the head noun is not here a deverbal nominalisation. However, nouns considered as relational are not generally treated as necessarily deverbal (compare *friend*). Payne and Huddleston (2002) suggest that in these cases a relational interpretation is available by virtue of the activity associated with the denotation of the head noun, even if no

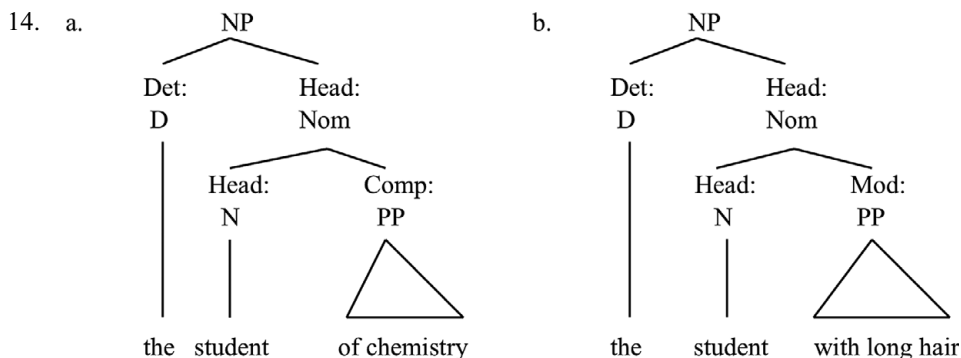
² Within functional approaches to nominal pre-head dependents which do not distinguish between complements and modifiers, e.g. Davidse and Breban (2019), such dependents, both adjectival and nominal, are regarded as ‘type-indicators’. As will be shown below, this is fundamentally the same conclusion to which the case studies in section 4 point.

direct nominalization is involved. So we have ‘person who relates to X qua Y’, e.g. an ecology expert is a ‘person who relates to ecology qua expert’. As before, these adjectives are straightforward derivatives (or are semantically related) to nouns which can appear (with varying facility) as pre-head dependents with essentially the same meaning, and in some cases there is also an apparently subcategorised PP as an equivalent (see *expert in ecology*). However, even within a framework distinguishing between complements and modifiers, the case for treating such adjectives as complements seems less secure.³

Based on the arguments expanded above, Payne and Huddleston (2002), treat adjectives such as those discussed in this section (as well as the related pre-head nouns) as noun phrase complements by virtue of the relational nature between them and the head nouns they are dependents of. Payne and Huddleston (2002: 440) point especially to the correspondence these pre-head adjectives (and nouns) display with post-head PPs in which the preposition chosen appears to be subcategorised by the head whether this be the regular *of* corresponding to thematic arguments or one with narrower semantics:

12. a. electrical supply
b. supply of electricity
13. a. ecological expert
b. expert in ecology

CGEL does not follow the X-bar theory of noun-phrase structure. In place of the N-bar node there is a category Nom which represents the head noun plus any of its internal dependents, i.e. those below the level of determiner, without any structural distinction between complements and modifiers. Nevertheless, a distinction between complement and modifier is maintained by the device of annotating each category node with its functional role.⁴ The CGEL equivalent of the X-bar structures in (3) is then (14):



³ For example, a reviewer points out that a better interpretation of (11b), rather than ‘person who relates to crime qua lawyer’ might be ‘person who specialises in criminal law’, in which case ‘criminal’ would rather modify ‘law’.

⁴ Note that the formalism places the function first, followed by a colon, with the category below. ‘Det’ in the CGEL notation denotes the function ‘determiner’, and ‘D’ denotes the category ‘determinative’. For the motivation to place determiners as dependents (of Nom) rather than as head, see Payne and Huddleston (pp 357–58).

In these diagrams both the complement and the modifier are structurally in identical positions as sisters of the head. The implication of these representations, as internal dependents are recursively added, is that any ordering constraints between them must be stated separately. Payne and Huddleston (pp 452–55) accept the rigid ordering constraint for pre-head noun-phrase dependents implied by the standard X-bar structural distinction, namely that complements occur adjacent to the head, the relevant constraint being formalized as (15), where ‘>>’ denotes a rigid order:

15. Determiner>>Pre-head modifiers>>Pre-head complements

The claimed rigidity of this ordering contrasts strongly with the labile, i.e. freer order ascribed to post-head complements and modifiers.

The ordering between multiple pre-head modifiers on the other hand is unequivocally labile, but subject to semantic typing. It is formalised as (16a) and (16b), where ‘>’ denotes a labile order:

- 16 a. Early pre-head modifiers > Residual pre-head modifiers
 b. Evaluative> General Property>Age>Colour>Provenance>Manufacture>Type

The distinction in (16a) between early and residual pre-head modifiers will not concern us here (early pre-head modifiers are entities such as numerals, cardinal and ordinal). But the distinction between the rigid order in (15) and the labile order in (16b), which attempts to characterize the natural semantic ordering of, *inter alia*, standard attributive adjectives, will be very relevant.⁵

4. The validity of the complement-modifier distinction: case studies

At the time CGEL was published (2002), the validity of a distinction between complementation and modification was widely accepted,⁶ and the move described in Section 3 to extend the distinction to pre-head adjectival dependents seemed well-motivated. Indeed, the distinction between complements and modifiers has largely survived intact in subsequent syntactic analyses of English noun-phrases, and the existence of a class of relational nouns has persisted as a widely accepted postulate in formal semantics, e.g. Partee and Borschev (2012). Indeed, it survives in the Distributed Morphology approach to pre-head dependents as constituents of compounds derived by syntactic incorporation into a head (see, for example, Harley 2009).

Nevertheless, a comparatively small but significant body of work has since arisen which casts doubt on both the syntactic and semantic criteria which have been used, not just in the discussion of noun-phrase structure but also with respect to verbal dependents.⁷ This critique

⁵ The attempt at a semantic typing of adjectival order in (16) is ultimately inspired by Dixon (1982). A reviewer points to a potential distinction between such ordering constraints and those of functionally based accounts, e.g. Feist (2009), in which individual adjectives can have different position and meaning according to their function, e.g. *old* (descriptor function, meaning ‘aged’), *old* (classifier function, meaning ‘long-standing’ *friend*). However, within the semantic typing approach nothing fundamentally seems to prevent an individual adjective from having two or more distinct senses.

⁶ An exception was early work within HPSG (Head-Driven Phrase Structure Grammar), e.g. Przepiórkowski (1999), Bouma et al. (2001).

⁷ See McInerney (2025), and references cited there, for full discussion of the problems with using substitution criteria, e.g. *do so*, as potential justification for the complement-modifier distinction in verb phrase structure.

typically uses naturally occurring corpus examples. In particular, pioneering the doubt, Keizer (2004, 2011) uses corpus examples to demonstrate the shakiness of a range of complement-modifier criteria, both in verbal and noun phrase structure. Payne, Pullum, Scholz and Berlage (2013) then focus specifically on the claim that pro-form *one* acts as a substitute for N-bar and therefore cannot be used immediately preceding an *of*-PP complement. Turning specifically to the pre-head position in noun phrases, Portero Muñoz (2013) uses a wide-ranging collocation analysis to question the relevance of the complement-modifier distinction in noun-noun sequences. Przepiórkowski (2016b) on the other hand is a more formal proposal within the Lexical Functional Grammar framework for treating all verb-phrase dependents in a structurally identical way.

We will return to the wider issue in the discussion section. However, the specific issue we wish to raise in this paper is whether it was correct, as outlined in Section 3, to postulate a distinction between pre-head adjectival modifiers and complements in NP structure. To this end, we present two case studies based primarily on data from the British National Corpus (BNC), the first based on the head noun *student* and the second on the head noun *advisor*.

4.1. Case study 1 – *student*

The head noun *student* was chosen because in an uncomplicated manner it represents the standard case of a deverbal noun for which the underlying verb *study* is transitive and there is a straightforward semantic correlation between the direct object of the verb (*study archaeology*), the *of*-PP of the nominalisation (*student of archaeology*), the pre-head noun dependent of the nominalisation (*archaeology student*), and indeed the corresponding pre-head adjective dependent of the nominalisation (*archaeological student*).⁸

In order to obtain a preliminary insight into the potential collocates of the head noun *student*, we extend the procedure of Portero Muñoz (2013) to examine both nouns and adjectives in the immediate position preceding this noun. The data are taken from the British National Corpus (see Burnard (2007), henceforth BNC), and presented in Table 1.⁹ We concentrate on just the strongest collocations as exhibited in this corpus.

What is immediately striking is that, as Portero Muñoz (2013) found more generally with respect to first noun collocates in noun-noun constructions, the immediate left collocates of this standardly ‘relational’ noun are not typically relational or ‘complement-like’. The only thematic collocate in this set is the adjective *medical*, whereas the remaining collocates essentially denote a variety of subcategories of student, based on

⁸ As a reviewer points out, the noun *student* is, in many contexts, not regarded as a relational noun, being sufficiently informative in its own right in examples like *She is a student*. This can be contrasted with *advisor* in *She is an advisor*, which will be informative on its own in fewer contexts. This issue is treated formally in Payne et al. (2013), where all nouns are considered as varying non-relational or relational, with varying likelihoods of each of the two possible interpretations. As the reviewer points out, context will play a crucial role at the level of individual uses, for example, the argument may be contextually retrievable, or the noun might be being used generically. The reviewer also suggests that, in the case of *student*, the dual interpretation, relational or non-relational, might be due to speakers having a dual access route to its morphological structure (e.g. Hay 2002), either as a complex, deverbal noun, or as a simple underived noun. We note, however, that varying likelihoods of relational and non-relational interpretations are also available to non-derived nouns.

⁹ The BNC interface used was the CQP edition, developed by Sebastian Hoffmann and Stefan Evert.

Table 1. Immediate left collocates (A, N or P) of the head noun *student* (BNC)

Left Collocate	Category	Count	Collocation Strength (log likelihood)
mature	A	236	2638
university	N	193	1226
postgraduate	N	103	1167
medical	A	159	1129
fellow	N	124	1006
overseas	P	113	925
research	N	171	880
graduate	N	83	838
full-time	N	67	554

seniority (*mature, postgraduate, graduate*), place of study (*university*), nature of study (*research*), origin (*overseas*), duration of study (*full-time*) and finally status with respect to other students (*fellow*). These would straightforwardly all correspond to ‘Type’ modifiers in the analysis of Payne and Huddleston (2002), the category of modifier typically closest to the head in the labile ordering. Now, of course, this in itself does not invalidate a potential distinction between pre-head modifiers and complements. It is, however, indicative that the relational aspect of the noun *student* is not, from a collocation strength perspective, particularly salient.

In order to pursue the thematic or ‘complement-like’ pre-head dependents of *student* in greater depth, we next turn to a comparison between their status as nouns or adjectives. Again using the BNC, we examine the frequency of occurrence of adjectival and nominal forms denoting the subject of study. The results are presented in Table 2.

What is striking in this analysis is first of all that the choice of adjective or noun to denote the thematic relation varies considerably on a lexical basis. In some cases, strikingly *medical*, the choice of the adjectival variant predominates to the extent that there are zero examples of the corresponding noun in the same function. In the case of *actuarial*, no corresponding noun for the subject exists. For *theological, architectural, archaeological* and *biblical* both adjective and noun variants are available, while for

Table 2. Adjective and noun thematic pre-head dependents of *student* (BNC)

medical	159	medicine	0
theological	9	theology	5
actuarial	4		
architectural	4	architecture	5
agricultural	4	agriculture	1
dental	3	dentistry	0
archaeological	2	archaeology	3
musical	1	music	14
biblical	1	Bible	3
chemical	0	chemistry	10

chemistry only the noun is attested. With *music* the overwhelming preference is for the noun.¹⁰ As confirmation that the adjective can indeed be used in the intended thematic sense, and not just in the sense ‘having an aptitude for music’ as in, for example, *a very musical person*, compare (17):

17. and in Scotland a LASMO Arts Trust has been set up to provide cash awards for **promising musical students** [BNC: GX8 391]

Now, this comparison between adjectival and noun pre-head dependents again does not in itself demonstrate the invalidity of a distinction between complements and modifiers. It does, however, strongly suggest that nouns and adjectives like these with an essentially identical meaning and function should be treated in exactly the same way. This indeed was the motivation behind Payne & Huddleston’s (2002) treatment of them equally as complements.

We have seen that thematic noun modifiers are, for *student*, not the most salient, and that there is a strong case that thematic nouns and adjectives should be treated in the same way. The argument we will employ here that these adjectival dependents should not be regarded as complements depends on adjective sequencing. The notion that pre-head adjectives, as well as nouns, could be treated as complements was based not just on their semantic relationship to the head noun and the comparison with PP post-head dependents, but on the notion that their complement status would place them rigidly adjacent to the head noun in the sequence of pre-head dependents. Examples such as those below suggest that this is not necessarily the case: in (18) and (19), corpus examples in which the order sounds entirely natural, the thematic noun denoting the subject studied precedes one of the salient ‘Type’ modifiers listed in Table 1:

18. THREE centres will run pilot schemes of four-year industrially-oriented courses for **[engineering postgraduate students]** as recommended in a report of a panel chaired by Dr John Parnaby of Lucas Applied Technology. [BNC: AHP 96]
19. This is undoubtedly the area in which the average **[computing undergraduate student]** is weakest. [BNC: CG9 472]

And for a similar example with a thematic adjective, consider (20). This example is a web-based example, since any such multiple combinations of dependents are exceedingly rare in the comparatively small BNC¹¹:

20. Karmanos guides the future for one budding **[medical research student]** [<http://karmanosconquerscancer.wordpress.com/>]

If we were to consider the thematic dependents in (18–20) as complements, this would necessitate the postulation of a labile order between specifically ‘Type’ modifiers and

¹⁰ A chi-squared test (with the Yates correction) shows, for example, that the difference between *theology/theological* and *music/musical* is significant at $p < .01$.

¹¹ Example (20) was sourced in 2013 using Webcorp (www.webcorp.org.uk). As of date (October 2024) it is no longer accessible.

complements. Note that the reverse ordering seems in principle possible: we could have *postgraduate engineering student*, *undergraduate computing student* or *mature medical student* with equal facility.¹² This seems a highly suboptimal solution. First of all, there appears to be no difference in ‘heaviness’ which might motivate the positioning of the supposed complement in a non-adjacent position. Secondly, if the supposed complement were simply treated as labile, why should it not be able to appear before ANY of the residual pre-head modifiers? The ordering of a thematic adjective before, for example, a ‘provenance’ adjective as in *medical English student* sounds somewhat implausible, albeit not impossible, in the right context.

The solution we propose avoids all these difficulties. It is simply that we should abandon the notion that the pre-head adjectives and nouns are distinguishable in any way as a separate class of complements, and treat them instead simply as belonging to a general class of residual pre-head dependents. Specifically, they would form a subset of ‘Type’ dependents, viz. a medical student is a type of student, just as a postgraduate student is a type of student.¹³ The classification of students will then involve many dimensions, not just seniority (*mature, postgraduate, graduate*), place of study (*university*), nature of study (*research*), origin (*overseas*), duration of study (*full-time*) and status with respect to other students (*fellow*), but also the subject of study. Such a solution explains the fact that, like ‘Type’ dependents in general, they typically appear closer to the head than other pre-head dependents, but also the fact that there is some flexibility as to which of a plurality of ‘Type’ dependents occurs in which order. An intuition, which deserves further study, is that what is considered by the speaker to be the higher level of classification will be placed closer to the head.

4.2. Case study 2 – advisor

The noun *advisor* was chosen for the second case study since the verb from which it derives not only licenses a straightforward direct object corresponding to a thematic (or possibly recipient) argument, as in *advise [the president]*, but also arguably a second non-agent argument represented by a subcategorised *on*-PP as in *advise the president [on finance]*. Both of these have counterparts as adjectival pre-head dependents, as illustrated in (21):

21. a. What Ennis, the **Presidential advisor**, had actually said was: ‘Manville, have you got fuckin’ rocks in your head or something?’ [BNC: CSA 357]
- b. Graham Brookhouse, 29, juggles a career as a **financial advisor** with his athletic life. [BNC: ECU3407]

¹² Examples such as *graduate medical student*, where the adjective intervenes between the noun dependent and the head noun suggest that the orderings here cannot simply be based on the principle that adjectival dependents precede. We cannot therefore simply argue that in *medical research student*, the adjective is where it is because of its category (regardless of whether *research student* is treated, as here, as a syntactic construction, or as a compound noun. By contrast, examples such as *research medical student* seem less felicitous when the thematic adjective is adjacent to the noun. In the case of ‘Type’ dependents such as *research*, which we described as denoting the nature of study, the collocation strength between the Type dependent and head noun appears to be particularly strong.

¹³ This proposal then, at least with respect to ordering constraints, essentially coincides with the notion of classifier developed within the functional framework. In particular, the possibility of multiple classifiers has been proposed in the functional framework (see Feist 2009: 238).

Table 3. Immediate left collocates (A or N) of the head noun *advisor* (BNC)

Left Collocate	Category	Count	Collocation Strength (log likelihood)
financial	A	33	347
legal	A	23	236
investment	N	20	206
tactical	A	10	145
professional	A	12	111
continence	N	4	69
technical	A	7	64
scientific	A	6	55
mortgage	N	5	51

Henceforth, we will call dependents such as *presidential* simply ‘thematic’, while dependents such as *financial*, which denote the content of the advice, will be termed ‘content’ dependents.

As with the first case study, in order to gain a preliminary insight into the relative salience of these two types, we carry out a collocation analysis into the immediate left collocates, both adjective and noun, of the head noun *advisor*. The results are presented in Table 3.

What is immediately striking about the analysis in Table 3 is that the strongest left collocates of the head noun *advisor* invariably represent not the thematic argument, but the argument corresponding to the *on*-PP, i.e. the content argument representing the nature of the advice.¹⁴ This argument can take the form either of an adjective or a noun, and in some cases there is a potential alternation, namely with *financial*~*finance*, *legal*~*law*, *tactical*~*tactics* and *scientific*~*science*. The distribution of these potential alternates is shown in Table 4.

That is, the adjectival variant is overwhelmingly preferred, the one exception being *scientific*~*science* with a single example of the noun¹⁵:

22. The chairman of the new council will be Sir John Adams, a **science advisor** to the EEC and virulent critic of the mishandling of super-SARA (New Scientist, 10 February, p 354). [BNC: B7L 331]

Table 4. Adjective and noun pre-head dependents of *advisor* (BNC)

financial	33	finance	0
legal	23	law	0
tactical	10	tactics	0
scientific	6	science	1

¹⁴ A reviewer agrees that this is simply a reflection of people’s extra-linguistic experience: in most cases, advisors are more frequently subcategorized according to what they advise on, not on whom they advise. This has very little to do with the status of these elements as complements.

¹⁵ Note that this example also contains a *to*-PP corresponding to the possible interpretation of the EEC as recipient rather than theme.

As far as the treatment of these adjectives and nouns as complements is concerned, it is worthy of note that when adjectives of the theme or content type occur simultaneously, as in *presidential financial advisor* or *presidential legal advisor*, it is the content adjective, e.g. *financial*, which naturally occurs closer to the head noun. Attested examples are given in (23):

23. a. Resignation of **presidential economic advisor** [BNC: HL3 1962]
 b. Sergei Shakhrai, former **presidential legal advisor**, warned in Komsomolskaya pravda of Aug. 8 that the SC had fallen into the control of conservatives who were hoping for a return to the administrative-command system. [BNC: HLM 1736]

This pattern of theme-first recurs with noun rather than adjectival dependents, as in (24a), or in mixed category examples such as (24b):

24. a. According to Walter Easey, the ALA **police policy advisor**, under Sir Kenneth Newman, this would have been quite impossible [BNC: AZY 410]
 b. An interesting piece of evidence was adduced: regular walking holidays in Wales with the **government economic advisor** to the government, Terry Burns. [BNC: CAK 1184]

The first point to make about such examples is that they are potentially structurally ambiguous. (24a), in particular, could be analysed with the bracketing *[[police policy] advisor]*, where *police policy* forms a unit, either a compound or a composite nominal depending on the framework, as the single dependent of the head *advisor*. This bracketing is unproblematic whatever the framework, since this single dependent could be treated either as a complement or as a modifier in a framework which required such a distinction. The alternative bracketing *[police [policy advisor]]*, i.e. ‘advisor to the police on policy’, where there are two separate dependents of the head *advisor*, is the one of interest. In (24a), either bracketing seems plausible. In (24b), on the other hand, where the closer dependent is adjectival, the only plausible analysis is one in which there are two separate pre-head dependents (due to restrictions on nouns acting as pre-head dependents of adjectives).

With the two-dependent bracketing we would expect, under a composite nominal analysis, labiality between the two dependents as well as coordination of dependents with the same function. This is exactly what we see. A reviewer points to the possibility of examples such as *former legal presidential advisor* (web-attested, but rarer than the Thematic>Content order exhibited in (23b)), as well as coordinations such as *legal and economic advisors* (coordination of content dependents), and even mixed-category coordinations such as *industrial and government policy advisors*, where *industrial* and *government* can plausibly be interpreted as thematic, i.e. ‘advisors to industry and the government on policy’.

One option for preserving the complement-modifier distinction might be to propose that in the case of head nouns like *advisor* (with the two-dependent structure) two pre-head complements are allowed. This would correspond to the licensing of two subcategorized post-head PPs, as in *advisor of/to the government on policy*. In that case, adjacency of complements to the head would be maintained.

However, this again, as in the case of *student*, appears to not be the optimal solution. The reason is that it is possible to find a class of ‘Type’ modifiers which can occur closer to the

head than either of the two classes of dependent under discussion. These are ‘seniority’ classifications such as *senior*, *special* and *chief* which rank below the strongest collocates identified in Table 3, but nevertheless are frequent enough to co-occur in the requisite position in web-based searches.¹⁶ Examples are given below, first in (25) in conjunction with a theme/recipient dependent:

25. a. Ivanka Trump stuns in a plunging and strapless red dress as she attends a friend’s wedding in Mexico - as former **presidential senior advisor** issues major update on any return to politics.
[<https://www.dailymail.co.uk/news/article-13384833/ivanka-trump-dress-mexico-wedding-teases-politics-return.html>]
- b. She is currently working as an intern **ministerial special advisor**, working alongside a member of Cabinet with the GNWT, and is in the process of being signed on as an assistant negotiator.
[<https://www.schoolofpublicpolicy.sk.ca/news-events/news-articles/2022/building-capacity-in-the-north.php>]
- c. Celso Luiz Nunes Amorim, Brazilian **presidential chief advisor**, attends an international conference focused on Venezuela’s political crisis, at the San Carlos Palace, also known as the Foreign Ministry, in Bogota, Colombia, Tuesday, April 25, 2023.
[<https://apnews.com/article/venezuela-conference-colombia-petro-maduro-opposition-965a16b32c0426085c41ed7a2e29696b>]

The alternative order is, of course, freely available here (*senior presidential advisor*, *special ministerial advisor*, *chief presidential advisor*), with varying focus on the higher level classification, exactly what we would now expect if these were all treated as different classes of ‘Type’ dependents.

A similar variability in ordering can be seen in conjunction with the ‘nature of advice’ dependents, as shown in (26):

26. a. Several special guests attended including the **Government Scientific Chief Advisor** and chief executive designate of the UKRI, Professor Sir Mark Walport...
[<https://blogs.imperial.ac.uk/fom/2017/06/22/mrc-london-institute-of-medical-sciences-lms-update-2/>]
- b. The estimated total pay for a **Financial Senior Advisor** is £65,821 per year, with an average salary of £51,196 per year.
[https://www.glassdoor.co.uk/Salaries/financial-senior-advisor-salary-SRCH_KO0,24.htm]
- c. Ward’s new role as **economic special advisor** is an influential backroom position in British politics at a time when Hammond is considering how much to cushion the economic shock of June’s vote to leave the EU, and how far to protect Britain’s financial services sector in upcoming EU talks.
[<https://www.reuters.com/article/business/uk-chancellor-hammond-names-hsbc-economist-as-senior-advisor-idUSKCN1280TS/>]

¹⁶ The examples in (25) were sourced (October 2024) using Webcorp (www.webcorp.org.uk) and the Bing search engine, while those in (26) were sourced using Google (www.google.co.uk).

Note that (26a) contains examples of all three classes of the pre-head dependents under discussion, in the order Thematic>Content>Seniority. And as with (25), alternative orders are freely available, e.g. *chief scientific advisor*, *senior financial advisor*, or *special economic advisor*. The order chosen in any particular context seems likely to depend on which classification is treated as the higher-level one, that being placed closer to the head.

The optimal analysis for the supposedly ‘complement-like’ pre-head dependents of the head noun *advisor* is, therefore, as with the supposedly ‘complement-like’ pre-head dependents of *student*, to treat them instead as various semantic subtypes of the general ‘Type’ classification.

5. Conclusion

While the case studies in Section 4 are limited to just two head nouns, *student* and *advisor*, it seems not implausible that the conclusion drawn from them will be applicable across-the-board, namely that pre-head internal dependents of nouns should not be divided at the highest level into two distinct classes of ‘modifier’ and ‘dependent’. Instead, there should be just one general class of ‘pre-head internal dependent’ divided into semantically defined subclasses with labile ordering, i.e. a preferred order which can be amended on a contextual basis. Within this general schema, the supposedly ‘complement-like’ dependents will be reanalysed as properly belonging to the ‘Type’ subclass, with a labile preference for adjacency to the head. As noted earlier, this modification, at least with respect to ordering principles, is essentially the same as has been proposed within the functional framework: that is, the ‘Type’ dependents of the CGEL framework will essentially correspond to the ‘classifiers’ of Feist (2009) and subsequent work.

In the event of there being multiple ‘Type’ dependents, the order will depend on which information has previously been invoked in the context. The likelihoods here may indeed depend lexically on the individual head noun. As the collocation studies show, status, including seniority as reflected in dependents such as *postgraduate*, represents a stronger collocation with the head noun *student* as a class of dependents than the subject studied, while on the other hand seniority, as reflected in dependents such as *senior* or *chief*, represents a less strong collocation with the head noun *advisor* than the person advised or the content of the advice. The arguments here have concentrated on adjectival pre-head dependents, but the arbitrariness in the availability of noun and adjective alternatives strongly suggests that noun pre-head dependents require an identical treatment.

In a framework such as CGEL, which does not adopt X-bar theory, in particular the node N-bar, and does not make a structural distinction between complements and modifiers, the modifications required to incorporate this proposed reanalysis would be minimal. Instead of (15), repeated here as (27a), we would just have the rigid ordering constraint in (27b):

27. a. Determiner>>Pre-head modifiers>>Pre-head complements
- b. Determiner>>Pre-head dependents

No further changes would be necessary: the original pre-head complements would simply be treated as semantic subclasses of the ‘Type’ dependent, with labile ordering. In its essentials, this is the same as the move made by Przepiórkowski (2016b) in the Lexical Functional Grammar Framework to recast verbal dependents as structurally identical, with no

distinction made between complements and modifiers and a differentiation made on a semantic basis.¹⁷

We have not been primarily concerned in this paper with the fraught distinction between compound nouns and, in the CGEL terminology, composite nominals, i.e. syntactic constructions in which the second noun is the head and the first noun is an independent word. Note that prosodic ‘compound-like’ vs ‘phrasal’ stress is often invoked as a diagnostic (Plag, Kunter & Schramm 2011, Bauer, Lieber & Plag 2013). In English pre-nominal sequences this is, however, an unreliable categorical test: stress varies with lexicalization and register, interacts with orthography (e.g. hyphenation) and dialect, and is reshaped by information structure and rhythm. Precisely the configurations at issue – *Type/classifier* adjectives and N–N composites – show variable prominence that does not consistently track putative complement status (cf. Giegerich 2005). We therefore treat prosody as ancillary; the conclusions of this paper rest on ordering lability, internal coordination, and A/N distribution.

In the CGEL framework, which argues for the primacy of coordination constructions as a diagnostic criterion (see in particular Payne & Huddleston 2002: 448–51), the examples in this paper would be composite nominals rather than compound nouns. However, the arguments presented here are essentially tangential to that issue and would, as far as we can see, apply equally in a framework in which they were not. We note nevertheless that the adjectival examples in the paper do satisfy the coordination diagnostic for composite nominal status.¹⁸ In particular, we have straightforward coordination of adjectival dependents, as in (28):

28. There is particular concern about the impact of this restriction on applicants for the foundation’s ‘intercolated’ awards, which enable [**medical and dental students**] to carry out a research project leading to a BSc. [BNC: FBP 131]

We have coordination of heads as in (29):

29. There is a wide consensus among [**medical educators and students**] about the need for change and the direction it should take, and there are plenty of examples from Britain and elsewhere that change is possible and can be effective. [BNC: EC7 1355]

And indeed, as a reviewer points out with respect to examples like [*adjectival and noun pre-head dependents*], we have mixed category coordinations which reinforce the similarity between adjectives and nouns in the same function.

The limitations of this study are obvious. Firstly we have considered only two head nouns as case studies, albeit in some depth. Secondly, the case studies are based primarily on a relatively small corpus, the BNC, albeit augmented by web-based examples. Thirdly, as an argument against the maintenance of the complement-modifier distinction we have restricted

¹⁷ Note that Przepiórkowski (2016b) adds the ‘obligatoriness’ of particular verb–phrase dependents, notably but not restricted to the direct objects of transitive verbs, as a distinct constraint. Such an additional constraint will not be necessary with noun–phrase internal dependents, which are invariably optional (apart from in certain fixed phrasal constructions such as *by dint of X*). See Payne, Pullum, Scholz and Berlage (2013) for further discussion of this point.

¹⁸ As would the noun examples, e.g. with coordination of pre-head dependents, [*music and theology*] students.

our attention to ordering constraints, namely the constraint that complements should theoretically be situated closer to the head than modifiers. We have not considered, specifically with respect to the two nouns *student* and *advisor*, any arguments based on anaphoric substitution (or other potential diagnostics). However, Payne and Huddleston (2002: 441) already briefly note the ‘limited extent’ to which anaphoric *one* functions as a diagnostic for distinguishing between noun-phrase internal complements and modifiers, both in pre-head and post-head position. For example, they contrast the ‘readiness’ of the combination with anaphoric *one* of the adjective *criminal* in the sense ‘who is criminal’ (as opposed to honest) with ‘resistance’ to substitution in examples like *?I needed a civil lawyer, but he had found me a criminal one* (where the intended interpretation is ‘lawyer who works in the field of criminal law’ and *criminal* is analysed as a complement). Extensive corpus-based documentation of the limitations of anaphoric substitution is then provided by Keizer (2004, 2011) and Payne, Pullum, Scholz and Berlage (2013), the former more widely, including with reference to verbal arguments, and the latter specifically with respect to noun-phrase internal *of*-PPs. The conclusion is likewise that attempts to uphold a binary distinction between complements and modifiers run into severe, and quite likely fatal difficulties.

Acknowledgements. This paper was presented at the colloquium held in honour of Geoff Pullum at the University of Edinburgh in September 2023, following his retirement. The topic is in harmony with the many hours and days I have enjoyed discussing the niceties of English grammar with Geoff, and particularly the doubts we have expressed elsewhere and cited here concerning the validity of the complement-modifier distinction with respect to *of*-PPs. Much earlier versions were presented at the Third International Workshop on the Structure of the Noun Phrase in English, University of Leuven (November 2013), and the 3rd Conference of the International Society for the Linguistics of English, University of Zurich (August 2014). I am grateful to the audiences on all these occasions for their helpful comments, as well as, especially, the JL anonymous reviewers. Responsibility for all the argumentation presented here of course rests with me.

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