Nouns and their prepositional phrase complements in English

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1. Introduction

This paper concerns one aspect of work in progress on a PhD thesis on the complementation of nouns in English (See Bowen (forthcoming)). The purpose of the thesis is to give a description of nouns and their complements which will prove of interest to linguists but will also be of interest, from a pedagogical point of view, to learners of English. Although there are extensive surveys of the noun phrase and its integral parts in grammars[1] and research alike, the complementation of nouns is often only discussed in connection with verb and adjective complementation[2]. Recent traditional grammars, Greenbaum (1996) for example, discuss noun complementation more fully. Biber *et. al*. (1999:604-656) discuss the different structural types of post-nominal patterns including: *that*-complement clauses, exemplified here in (1); *to*-infinitival complement clauses shown in example (2); *wh*-complement clauses shown in (3) and *of + -ing* constructions shown in example (4). Further, in Biber *et. al*. (1999:634), prepositional phrases are included in postmodification and dealt with separately. In the present study, however, the term *complement* is used to denote the postnominal elements which are bound elements selected by a head noun, including both clausal complements as in examples (1) - (3) and prepositional phrase complements (PPC) as in examples (4) - (7):

1) the fact that he will win
2) his need to win,
3) the decision whether it is worthwhile
4) the thought of losing the match
5) the involvement of the teacher
6) her reliance on drugs
7) their belief in the dollar

The focus of this paper is on the prepositional phrase complements illustrated in examples (5) – (7). Moving away from prototypical complements like the examples above, this paper explores other aspects of complementation. One consideration of interest is the type of noun which permits a PPC. In other words, do only nominalisations allow PPCs or are other nouns found with complements and to what extent do nominalisations "inherit" their complementation patterns? Another question addressed in this paper is the type of preposition found heading a PPC. Also of interest are the number of complements which are permissible with one noun and the question of the order of complements when more than one is present. Finally, instances of postponement of the complements will be discussed. These issues are addressed in this paper.

2. Method

In order to analyse and study the patterns of nouns used in English today, a corpus of authentic sentences was collected. As a point of departure, all the nouns requiring all types of post-nominal elements, i.e. both phrasal and clausal elements were extracted from two learners' dictionaries of English. This extraction included 1904 nouns. As a qualitative rather than quantitative study of nouns is part of the aim, a 25% sub-set of these nouns was systematically selected to form the basis of this study. Sentences including examples of the subsequent 476 nouns have been extracted from the Cobuild*Direct* and BNC corpora. The frequency of the nouns in the corpora varied considerably which entailed that for some of the nouns, a complete search was possible, e.g. *seizure* with 166 instances in the Cobuild*Direct* corpus, whereas for extremely frequent nouns such as *place* with 30,337 instances, a percentage of the examples was randomly extracted.

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[1] See Quirk *et. al*. (1985:1238ff)
[2] See Herbst (1988:266) for a discussion of previous research.

An analysis of the sentences was conducted with the help of a number of syntactic and semantic criteria[3] in order to establish complementhood. The distinction between complements and adjuncts is far from clear cut and should be seen in terms of a cline. PP-adjuncts which are not bound to the head noun are usually markers of description such as *the wines of France* or *a book of poems* or PPs denoting place and time such as *a book on the floor* or *the car in the garage*. At the other end of the cline, PPCs are typically bound to their heads as in *a ban on smoking*, *an introduction to linguistics* or *the request for money*. Between these prototypical cases, the cline includes partitive complements such as *a chunk of cheese*, and intermediate complements such as *the cradle of free enterprise*. For 65 of the nouns, the prepositional phrases functioned as clear cut adjuncts as in *a blaze of colour* or *the shank of the screwdriver* and as such were excluded from the survey. The analysis showed that 411 nouns were found with PP-complements.

3. Which nouns take complements?

In order to determine if patterns of complement-taking nouns (CTNs) exist, the nouns were grouped into three word formation categories. The first group comprises derived nouns which contain distinguishable overt suffixes as in *decision* and *ability* and which have been labelled "derived". The second group comprises nouns which have the same form as other word classes, i.e. they have no overt suffixation as in *hope, right* and *answer*. These are referred to as either verb or adjective "linked" nouns. The last group includes nouns which are non-derived, i.e. they have no evident connection to other words classes, such as *idea* and *fact*. The reader must keep in mind that a division of this kind is, however, problematic and that the focus of this work is on complementation and not morphology as such. Therefore, there are some cases where the categorisation is difficult, e.g. *proclivity* with an overt suffix but with no corresponding verb or adjective. The word formation division of the 411 corpus nouns which take complements is illustrated in table 1:

Table 1 Morphological distribution of corpus nouns

Derived Nouns	Linked Nouns	Non-Derived Nouns
196	118	97

Additionally, both the derived and linked categories of nouns have been further sub-divided into nouns with deverbal as in *reliance on*, *argument against*, de-adjectival such as *allergy to*, *evidence on* or denominal derivation such as *relationship between*. The derived and linked nouns together represent 77% of all the CTNs. The category of non-derived CTNs are also found with all types of PPCs such as *moratorium on, antidote to, clue to, spokesperson for*.

In general, it can be said that the derived and linked nouns "inherit" the same prepositions as the verbs and adjectives from which they are related, e.g. *adherence to, belief in* and *collision with*. For some nouns, such as *ability* which predominantly takes *to*-infinitival clause complements (cf. adjective *able to*-v), a variety of PPCs have been found, e.g. *the jumping ability of your animal; his ability at mathematics; his ability for schoolwork* and *the children's ability on language skill*. In a few cases there are differences in complementation patterns such as the adjectives *weak at/in/from/with* and *fond of* compared to *weakness for* and *fondness for*. The alternation between prepositions for one and the same noun may also entail a change in meaning such as *adoration of* and *adoration for*.

4. Which prepositions head PPCs?

The following table illustrates a break-down of the nouns which take complements headed by different prepositions. The nouns are divided into their morphological categories and the number of nouns is supplied for each preposition. The right-hand column supplies the total number of nouns for each individual preposition. It must be kept in mind that one and the same head noun can take more than one type of PPC as in, *the accusation of/by/against NP*, or *a search of/for/by NP*.

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[3] Following, amongst others, Aarts (1997), Allerton (1982), Chomsky (1970), Collins (1991), Haegeman (1994), Jackendoff (1977) and Radford (1988).

Table 2 Distribution of nouns and prepositions

Preposition	Derived Nouns	Linked Nouns	Non-derived Nouns	Total
of	186	121	96	403
for	36	27	21	84
to	35	15	11	61
by	39	12	1	52
on	25	14	4	43
from	21	18	1	40
against	17	16	3	36
between	18	11	7	36
in	18	10	6	34
with	15	7	4	26
about	13	6	1	20
over	4	13	2	19
towards	10	5	1	16
at	6	4	1	11
behind	1	-	-	1
into	1	-	-	1

It is noteworthy that of the 411 CTNs in the corpus, 403 or 98% take *of*-PPCs. The prevalence of *of*-PPCs can be explained by the versatility of this preposition, i.e. that it is found across the full spectrum of *of*-phrases. Its use is frequent in subject- and/or object-related complements but also in partitive complements and intermediate complements. For the remaining prepositions, their use is not so much a question of a cline but one which can involve subcategorisation as in *solution to* and *dependence on* or where the meaning of the preposition is decisive *a book on linguistics* or *a misunderstanding about the money*. The *by*-PPCs differ in that they only represent subject-related complements as in *the ruling by the court*.

5. Number and preferred order of complements

For the vast majority of CTNs, only one complement is typically present. The PPC of a head noun may represent subject- or object-related complements as in *the love of God* or be subcategorised by the noun as in *her belief in her daughter* but also combinations of two or three complements do occur:

8)   However, his accusation of corruption against the Prime Minister and her Cabinet members results in the Government. . . (Cobuild*Direct* times/10).

9)   Thus the elevation of potters from the humble status of craftsmen to bona fide artists was given its greatest boost in. . . (Cobuild*Direct* ukmags/03).

In example (8) the head noun *accusation* is followed by two complements, an *of*-PPC and an *against*-PPC, whereas in example (9) the head noun *elevation* has no fewer than three complements represented by an *of*-PPC followed by a *from*-PPC and finally a *to*-PPC. In the literature, for example, Huddleston (1984:261) states that "NPs with more than one complement are generally rather infrequent". The corpus investigation shows that of the 411 CTNs in this study, 76 head nouns were found with double complements. This figure may give the impression that double complements are fairly frequent, but the 250 sentences found with this construction represent a very small section of the corpus material. The number of complements found with a head noun is restricted partly by the type of head noun but also by the length of the PPCs.

Having established that some nouns take more than one complement, it is of interest to determine whether there is a preferred order between complements. In cases where two complements are present, as in, *the exclusion of members by the committee* the object-related complement *of members* precedes the subject-related complement, *by the committee*. This order is found in the majority of double-complement sentences, however, examples in the corpus show that the order is by no means fixed:

10) . . . the seizure by Moscow of the provinces of Bukavina and Bessarabia. (Cobuild*Direct* bbc/06).

11) The seizure of two vessels by armed Chinese security forces who. . . (Cobuild*Direct* oznews/01).

12) The Contact Group believes recognition of Bosnia by Mr Milosevic would . . . (Cobuild*Direct* oznews/01)

13) This success was due to a persistent advocacy and a recognition by others of his sincere concern. (CobuildDirect ukbooks/08)

Other nouns found with alternating order of complements include: *acquisition, assault, ban* and *boycott*, to name a few. All the nouns found with alternating order of complements were either derived or linked head nouns; no non-derived nouns were found with more than complement.

From the corpus investigation, it appears that there are a number of influencing factors which determine the order of complements. To begin with, it is difficult to postulate anything concrete about text-type when the sentences are taken out of context, but it is obvious that the ordering of elements to give focus or end-weight is a deciding factor particularly in journalese, for example. Also the length of the PPCs appears to influence the order so that shorter PPCs tend to precede longer ones as can be seen in examples (10) – (13).

6. Postponement of complements

The usual position of prepositional complements in English is adjacent to the head noun. Cases where the complement has been moved rightwards to the end of the sentence do occur in the corpus, although they are rather rare. Radford (1988:448) illustrates this phenomenon thus:

14) [A review -] has just appeared *of my latest book*.

Using Radford's terminology the dash in example (14) represents a "gap" which the extraposed PP has left behind[4]. Examples from the corpus include:

15) A ban also has been introduced recently on the purchase of shares by senior officials although residents say that many city leaders succeeded in getting rich before it took effect. (Cobuild*Direct* bbc/06).

16) The search is still going on for the two gunmen who carried out the shooting. (Cobuild*Direct* ukspok/04)

In example (15) the *on*-PPC has been moved rightwards from the head noun *ban*, and in example (16) the *for*-PPC has been similarly moved away from *search*. In the case of example (16) the postponement may have been used to avoid the imbalance of a heavy subject NP followed by a relatively light predicate. In the case of example (15) this is not the case, however.

This construction is rare in the corpus with only 66 examples found. Not all the examples are as clear as examples (15) and (16); a certain amount of ambiguity exists:

17) The ban was imposed on Florey, of Bracknell, Berks, at a Jockey club disciplinary hearing. (CobuildDirect today/11)

18) And each time you spend on your card, a small donation is made to a worthwhile cause. (Cobuild*Direct* sunnow/17)

From the examples in the corpus, it can be concluded that the typical syntactic function of the NP in these constructions is that of subject and that the majority of NPs were found with indefinite articles as determiners.

7. Summary

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[4] Scholars differ in their approach to this phenomenon, see Culicover & Rochemont for a "base-generated" model.

The above sub-sections show the complexity of noun phrases and their complements and give some of the tentative results of this investigation. In summary, it can be said that approximately 80% of the CTNs in this material were derived or linked to verbs and adjectives. This entails that a considerable number of CTNs do take complements in spite of their lack of connection to other word classes. The majority of head nouns "inherit" the same complementation patterns as the verbs and adjectives to which they are related. From the 411 nouns which have been found to take PP complements, 98% were found with *of*-PPCs. Head Nouns are typically found with one complement, however, when both subject- and object-related complements are present, factors such as end-weight and focus influence the order. Few examples of PPC-postponement were found in the material but as the most common function of the NP is that of subject, the use of postponement avoids instances of imbalance in a sentence where a heavy NP subject is followed by a relatively light predicate.

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