

Modern and traditional descriptive approaches

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1. Introduction

The central goal of this chapter is to give a brief and preliminary account of why modern descriptions of English grammar depart (and should depart) so strikingly from the description given in traditional grammars of earlier centuries. We shall do this mainly by distinguishing the content of traditional grammars from that of *The Cambridge Grammar of the English Language* (Huddleston and Pullum 2002, henceforth *CGEL*), and exhibiting the motivation and justification for the assumptions and analyses found in *CGEL*. In the course of doing this we highlight some of the largely implicit syntactic theory underlying *CGEL*, and point out some parallels and contrasts with certain modern theoretical frameworks for syntax.¹

CGEL's departures from traditional grammar are not motivated by changes in the language (English syntax has been remarkably stable over the relevant period), nor by its occasional prescriptive leanings (which 20th-century linguists tended to exaggerate), but rather by concerns about descriptive adequacy. Traditional grammars drew the wrong distinctions, adopted inappropriate criteria, and missed key generalizations, but outside of the linguistics profession they have gone unchallenged: the content of grammar books for school students or the general public has scarcely changed in two centuries. *CGEL* takes the view that readers with a serious interest in the structure of contemporary Standard English deserve an account that does not just repeat the unjustifiable analyses of yore. We retain traditional terminologies and assumptions wherever that is reasonable, because there is no virtue in neologism simply for its own sake and we have no proprietary interest to promote. But we break with the tradition and its terminological practices wherever we find it conceptually muddled, empirically indefensible, or grossly misleading.

In a similar way, *CGEL* does not attempt to adhere to the assumptions or terminology of any particular modern theoretical framework. It draws on numerous modern theoretical and descriptive proposals, but always with a view to incorporating discoveries about how English syntax works, never with the aim of following or vindicating specific theoretical ideas. Our watchword in preparing *CGEL* was not orthodoxy but consistency: we tried to ensure that whatever assumptions were maintained in any part of the book were maintained throughout all of its twenty chapters.

2. Traditional grammar

The remarkable accomplishments of the early English grammarians should not be overlooked simply because they got so much wrong. If they tended to navigate by reference

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to the ill-suited star of Latin, it was only because following the model of reliable reference grammars for more suitable languages — relatively uninflected ones with largely fixed constituent order, preposition stranding, and so on — was not an option, since there were none. The fact that Bullokar (1586) posited five cases for the nouns of English, unmotivated by the visible morphology, is not so extraordinary. What is more surprising is that within a century Wallis (1653) — written in Latin — was able to break free and recognize that English simply did not have Latin’s grammatical case and gender distinctions (Linn 2006, 74–75). And if some early grammarians seemed to think of English as a disreputable language needing to be cloaked in respectable Latin vestments, that view had largely faded by the mid-18th century.

Lowth (1762) is often unfairly characterized as a peddler of prescriptivism, but he was well aware that English was a preposition-stranding language whereas Latin was not. He perceived correctly that stranding is informal: it “prevails in common conversation” and in “the familiar style in writing.” He called it “an Idiom which our language is strongly inclined to.” (His humourless plagiarizers later rendered this as “an idiom to which...”; see Tieken-Boon van Ostade 2011, 115–116.)

Some of the most obvious problems with traditional grammar (we consider other failings in later sections) stem from its tacit assumption that words can be assigned to their appropriate word classes (‘parts of speech’) by means of definitions based on vague, intuitive notions of meaning. Bloomfield’s cogent critique of this idea (1933: 266ff) should have been sufficient to eradicate it, but instead the traditional definitions survive to be repeated in grammar books even today.

The classic example is the definition of nouns as words that name things. Such a definition seems to imply, absurdly, that it would be possible in principle to first identify what ‘things’ there are in the world – to identify all the absences, actions, answers, arguments, aromas, aspects, averages, and so on – and then, having verified that these are indeed things, use that as the basis for classifying words like *absence*, *action*, *answer*, *argument*, etc., as nouns. But clearly, the concept of ‘thing’ needed is far too vague to determine any useful classification. We don’t first perceive that the world contains absences and then deduce from this that *absence* is a noun. It is more plausible that our naive conception of thinghood stems from our grasp of our language: to the extent that we conceive of absences as things at all, it is only because we have unconsciously registered that the word *absence* behaves in nounlike ways syntactically.

It is true that every language has a grammatically identifiable class of words that contains (inter alia) the names of temporally stable types of entities and physical materials; that is what makes it natural to use the term ‘noun’ not just for words like *book* in English but also for words like *livre* in French, *hon* in Japanese, *kitabu* in Swahili, etc. But *CGEL* follows modern linguistics in assuming that rigorous criteria for identifying the nouns of English will call for structural criteria of a sort that will not apply identically in all languages. English nouns are found accompanied by dependents such as determinatives, adjectives, preposition phrases, and relative clauses; they exhibit a plain/genitive case distinction; they mostly show a singular/plural inflectional distinction; and so on. Any coherent classification of words into categories must be based in grammatical behaviour; a hazy notion of reference will not suffice. (For additional discussion, see Hollmann, this volume.)

3. Category and function

The structure posited for linguistic expressions by *CGEL*'s underlying system of assumptions has three basic aspects. The first, the basic premise of all phrase-structure syntax, is that expressions are made up of structurally distinct parts (constituents) which may themselves have subparts (subconstituents). Clauses are composed of phrases, phrases may contain other phrases, and the ultimate constituents are words. Traditional grammar does not really endorse this view, but rather seems to presuppose something more like dependency grammar, where expressions are sequences of words that bear dependency relations directly to each other. (Word-based dependency frameworks continue to be developed within current linguistics; see Hudson 2010 and Herbst, this volume.)

The second assumption is that not just words but also phrases are classified by a system of **categories**. Words belong to lexical categories like noun, verb, adjective, etc., and phrases belong to phrasal categories like noun phrase (NP), verb phrase (VP), adjective phrase (AdjP), etc.

CGEL maintains that almost all phrasal categories above the word level (the sole exception being coordinations) have endocentric structure: exactly one immediate subpart of a phrase has the special status of being the **head**: the subconstituent which determines for syntactic purposes what kind of phrase it is. This is the familiar assumption originating with Harris (1951, section 16.21) and later, dubbed X-bar theory, assumed in most generative grammar during the 1970s and 1980s (Chomsky 1970, Jackendoff 1977, Gazdar et al. 1985).

The third assumption is that the categorized subconstituents of sentences have grammatical **functions** within the constituents that immediately contain them. The theoretical status of such functions has been controversial. Longacre (1965:67) remarks:

Traditional grammar talked much of functions—subject, object, modifier, etc.—but did not pay sufficient attention to form to bring such functions into clear focus. Earlier American structuralism, with adolescent enthusiasm, all but tossed out function in its zeal for form.

The structuralist position he refers to was rendered fully explicit by Chomsky (1965: 68–74), who argued that including functions explicitly in clause representations would be redundant, since notions like ‘subject-of’ and ‘complement-of’ are already represented in ordered, node-labelled trees: they are defined configurationally. Provided the rules of the grammar ensure that a clause node never immediately dominates more than one NP, then ‘subject of clause *x*’ is reducible to ‘NP-labelled daughter of clause node *x*’. Rules assigning semantic roles like ‘agent’ and transformational syntactic rules like subject auxiliary inversion and subject verb agreement can be stated purely in terms of categories and dominance relations, so mentions of ‘subject-of’ can be effectively eliminated from the theory altogether.

The relational grammar framework developed during the 1970s and 1980s (see Perlmutter 1983 for a sample) reacted directly against this by proposing that it was functions (grammatical relations) that should be taken as syntactic primitives, and categories that were (at least to some extent) dispensable.

Certain other frameworks, however, have taken a third view: that functions and categories, though crucially separate, are both independently needed, and neither is eliminable, or derivable from the other. An early example is Kenneth Pike’s tagmemics (see Cook 1969 for an introduction). In tagmemics, function and category (sometimes called

‘slot’ and ‘class’) are equally important components of syntactic representations. Longacre (1965:67) calls the framework “a reaffirmation of function in a structuralist context.” Notationally, at least some tagmemic works use trees with node labels of the form ‘Subject:NP’ to represent an NP functioning as the subject of the immediately containing clause. *CGEL* adopts this notation for indicating functions in syntactic representations.

The modern frameworks to which *CGEL* can be regarded as most closely allied are Lexical-Functional Grammar (LFG), developed since about 1980 by Joan Bresnan and colleagues (see Bresnan et al. 2016 for an introduction), and Head-driven Phrase Structure Grammar (HPSG), developed since 1987 by Carl Pollard and Ivan Sag (Pollard and Sag 1994, Levine 2017). Both employ functions and categories as crucial independent elements of syntactic representations.

The inter-framework similarities are particularly clear when we consider what have become known as **unbounded dependencies**. Transformational treatments have always used movement rules to analyse dependencies such as the relation that holds between a clause-initial *wh*-phrase and a subsequent corresponding unfilled position within a relative clause. For concreteness, consider the underlined relative clause in this sentence:

The lecture was by someone whose book everyone said they had enjoyed.

In transformational grammar this would be assumed to have a derivation in which at an early stage the NP *whose book* follows *enjoyed*, but at some point it moves leftward to end up at the beginning of the larger clause beginning with *everyone said*. LFG and HPSG reject this. Bresnan et al. (2016, Ch 2) presents a selection of arguments against movement analyses, and offers (in Ch 9) an alternative. Other movement-free accounts of unbounded dependencies can be seen in Pollard and Sag (1994, Ch 4, presenting a theory modelled on Gazdar et al. 1985, Ch 7). The theories defended in these works differ in many ways, but they agree on certain essential points, the most important of which is that clauses are structurally described without positing derivations.

The treatment in *CGEL* is very much in the same spirit, positing a single structural representation for a sentence, rather than a sequence of such structures related by transformations. The NP *whose book* is in Prenucleus function, and the accompanying incomplete clause (*everyone said they had enjoyed*) is in Nucleus function.² Within it, the Object function normally associated with *enjoyed* is not filled.

We return to this topic in section 9, but it will be helpful at this point to exhibit a diagrammatic representation of the structure of *whose book everyone said they had enjoyed*, illustrating many of the analytical assumptions of *CGEL* that are discussed more below. We give this in Figure 1. (Abbreviations used: ‘Clause_{rel}’ = relative clause; ‘Det’ = Determiner; ‘Nom’ = nominal; ‘N’ = noun; ‘N_{gen}’ = genitive noun; ‘V’ = verb; ‘V_{aux}’ = auxiliary verb.)

[PUT FIGURE 1 ABOUT HERE]

² From here on, when referring specifically to *CGEL* function names like Head, Subject, Object, Complement, Predicate, Modifier, Prenucleus, Nucleus, etc., we give them capital initials. We allow ourselves abbreviatory locutions like ‘the Subject’ rather than ‘the NP that is in Subject function’, or ‘an internal Complement’ instead of ‘a VP-internal constituent in Complement function’, and when specifically discussing *CGEL* analyses we use a capital initial for those uses of function names too.

4. Pronouns and nouns

The category ‘pronoun’ is generally treated by traditional grammarians as a distinct primary ‘part of speech’ quite separate from noun — as would be suggested by the semantic intuition that a pronoun does not name anything but merely substitutes for a name.

The traditional analysis necessitates many awkward disjunctions: it is not just nouns that can take adjectives in attributive Modifier function, but either nouns or pronouns (*poor dad*; *poor you*); it is not nouns that serve as antecedents for reflexive pronouns (*The directors think a lot of themselves*), but NPs headed by either nouns or pronouns (*They think a lot of themselves*); it is not nouns that typically occur as Complements of prepositions (*of the memo*), but phrases headed by either nouns or pronouns (*of it*); and so on.

CGEL therefore takes pronouns to be a special subclass of nouns, similar to most proper nouns in hardly ever taking articles and only rarely taking an attributive adjective or relative clause as Modifier. Indefinitely many uses of the disjunctive term ‘noun or pronoun’ are thus avoided. Notice the relevance of the modern concept of a phrase here: in the traditional sense a phrase must contain more than one word, but in modern linguistics a phrase is a constituent intermediate between word and clause in the constituent structure of sentences, and may consist of just a noun, like *directors* or *them*.

5. Auxiliary verbs

CGEL takes auxiliaries (passive or progressive *be*, perfect *have*, supportive *do*, and the modals) to be verbs taking clausal Complements, not minor elements accompanying verbs or mere markers of inflectional features. Auxiliaries are verbs for Jespersen (1909–1949), but Charles C. Fries (1952) distinguished verbs (“Class 2 words”) from the class of minor verb-modifying elements in his “Group B”, and Chomsky (1957) followed essentially the same approach, introducing *have+en* and *be+en* without category labels under a phrasal umbrella category called ‘Aux’ also housing the ‘M’ (modal auxiliary) category. Many other works in the subsequent decades made similar assumptions. But it is misguided. The arguments in favour of taking every auxiliary to be a verb functioning as Head of a clause are compelling (see Ross 1969; Huddleston 1976; Pullum and Wilson 1977; Gazdar et al. 1982; *CGEL*, 1209–1220).

CGEL (65–66) treats auxiliaries as verbs that take **simple catenative** Complements: non-finite clausal Complements that are not Objects, or predicative Complements, or ascriptive or specificational Complements, but can be chained together (*may have seemed to want to try to appear to have been trying...*). As Ross (1969) first pointed out, verb phrase ellipsis facts strongly support this (*It may have been* and *It may have* and *It may* are all possible ellipses of *It may have been faked*). Chomsky (1957) posits unmotivated radical differences in phrase structure between such phrases as *ought to be competent* and *thought to be competent*, but both *ought* and *thought* can be treated as verbs taking infinitival Complements.

Chomsky (1957) also faces a difficulty with negation. There are generally three different negations for a clause with an auxiliary, because either clause or both can be negated:

<i>The senator has always taken bribes from lobbyists.</i>	(neutral; no negation)
<i>The senator <u>has not</u> always taken bribes from lobbyists.</i>	(have clause negated)
<i>The senator has always <u>not taken</u> bribes from lobbyists.</i>	(take clause negated)
<i>The senator has not always not taken bribes from lobbyists.</i>	(both clauses negated)

When the tensed auxiliary clause alone is negated, with a postposed *not*, the sentence asserts the existence of past time periods when the senator did not take lobbyists' bribes. If the nonfinite *take* clause is negated instead, with a *not* before the verb, we get a sentence that says the senator never once took a lobbyist's bribe. And finally, if both clauses are simultaneously negated, the result asserts that the senator has taken bribes on some occasions.

Treating auxiliaries as minor verb-modifying elements within a single clause, and *not* as an element that can optionally accompany them (as in Chomsky 1957), makes accounting for these facts difficult. The right general principle seems to be that every clause provides a potential locus for negation, and auxiliaries are verbs heading their own verb phrase, and ultimately their own clauses.

6. Adjectives, determinatives, and attributive modification

Virtually all traditional grammars and dictionaries define adjectives as words that have the semantic role of 'modifying' or 'qualifying' or 'limiting' a noun. But this cannot be taken as sufficient to establish adjectivehood, because words in a wide array of different categories can appear as Dependents of a following Head noun: not just adjectives (*expensive plane*), but also gerund-participles of verbs (*approaching plane*), past participles of verbs (*misidentified plane*), common nouns (*paper plane*), proper nouns (*Boeing plane*), dependent-genitive pronouns (*his plane*), articles (*the plane*), demonstratives (*that plane*), quantifiers (*every plane*)... If occurrence in attributive Modifier function were taken to be the sole criterion, the adjective category would be bloated up to the point of being vastly larger than any other category: it would encompass almost every noun in the language (including the pronouns in their genitive forms), and just about every article, quantifier, demonstrative, verbal participle, or genitive noun phrase.

It is surprising that so many dictionaries endorse this absurd consequence at least in part: nouns that frequently occur as Dependents preceding the Head in NP structure are often given additional entries as adjectives. *Webster's Third New International Dictionary*, for example, has extra 'adj' entries for *bottom, dog, fire, fool, head, iron, leaf, lip, morning, night, paper, salt, side, stock, stone, top*, and many other high-frequency nouns (see also Aarts, this volume).

Serving as Modifier of a noun is neither necessary nor sufficient for counting as an adjective. Not all adjectives can function as Modifier of a noun (*asleep* can't), and as noted above, not every Modifier of a noun is an adjective. Adjectives are characterized by a cluster of grammatical properties, with core members of the category having them all, while more peripheral members have some, but not all. The core adjectives share these three properties:

- (i) They can function as attributive Modifier preceding a noun (*obscure notions*).
- (ii) They can function as predicative Complement (*This is obscure*).

- (iii) They can take Modifiers of degree (*very obscure*) and exhibit comparative and superlative grade (*more/most obscure*).

The vast majority of the core adjectives — an open class including *abstemious, brilliant, combustible, democratic, efflorescent, fantastic, garrulous*, etc. — take the adverbs *very, extremely, more*, or *most* as modifiers of degree or comparison; a much smaller closed subset (*able, big, cute, dumb, easy, fine, great*, etc.) inflect for grade with *-er* and *-est*. More peripheral adjectives lack one or two of (i)–(iii); for example, *mere* has only property (i), *asleep* has only property (ii), *content* has only properties (ii) and (iii).

Separately from the adjectives, *CGEL* posits a category of **determinatives**, containing the articles, demonstratives, and quantifiers: *a ~ an, all, every, most, some, that/those, the, this/these*, and a couple of dozen other items. (A very small number of them, e.g. *little* and *many*, also belong to the adjective category, as in *A little bird told me* and *The defects were many*.)

The function most frequently served by determinatives is that of Determiner in an NP. The constituent in Determiner function combines with the nominal Head of an NP — the noun and its dependents — and fixes properties like definiteness: *box of tools* is not an NP but a **nominal**, composed of a noun and a preposition phrase. However, *this box of tools* and *Harry's box of tools* are definite NPs, and *some box of tools* and *a box of tools* are indefinite NPs. The underlined constituents are in Determiner function.

As with adjective and Modifier, the category is not to be confused with the function. Serving in what *CGEL* calls Determiner function is neither a necessary nor a sufficient condition for being a determinative.³ It is not necessary, because determinatives can also serve in Modifier function: the NP *one problem* has the determinative *one* in Determiner function, but in *the one problem we face* the same determinative functions as Modifier. And functioning as Determiner is not sufficient for being a determinative either: genitive NPs also serve in Determiner function (as in *the tenant's responsibility*).

The forms *my, your, his, her, its, our*, and *their* are traditionally called 'possessive adjectives', but this is another error (for discussion see Aarts, this volume). They are neither adjectives nor determinatives. They are the irregular dependent genitive forms of the personal pronouns *I, you, he, she, it, we*, and *they*, and they serve as Determiner just like any other genitive NP. (Dependent genitive forms of pronouns always and only serve as Determiner, whereas independent genitives like *mine, yours, hers, ours*, and *theirs* function as Head of a plain-case NP, and can never function as Determiner: **yours responsibility*.)

CGEL eschews the term 'possessive' altogether, despite the fact that genitives sometimes express some sort of possession. The expression *my house* can refer to the house I live in even if I am a tenant, rather than the owner. The uses of the genitive case go far beyond possession in any ordinary sense of the term. There is no literal possession implied in *Mike's sister*; *the dollar's strength against the euro*; *this plan's chief drawback*; *his having fallen*

³ There is some unfortunate terminological variation here. In Huddleston (1984) and in *CGEL*, 'determinative' is (like 'adjective') a category label and Determiner (like Modifier) a function name. Quirk et al. (1985), however, use 'determinative' as a function name and 'determiner' as a category. In many works 'determinative' is not used at all, and some use 'determiner' (or 'specifier') in ways that do not make it clear whether a category or a function is meant.

ill; high speed rail's huge initial cost; the prisoner's disgraceful treatment at the hands of the police, etc.

7. Prepositions, adverbs, and subordinators

Prepositions are traditionally defined as words that relate one noun to another. There could hardly be a better illustration of the way traditional grammar has failed to evolve over several centuries.

“The PREPOSITION”, says Lowth (1762), is “put before nouns and pronouns chiefly, to connect them with other words, and to show their relation to those words.”

“PREPOSITIONS serve to connect words with one another, and to show the relation between them,” says Lindley Murray (1795), paraphrasing.

“A **preposition** is a word used to show the relation between its object and some other word,” says Thomas Harvey seven decades later (1868).

“A Preposition ... shows in what relation one thing stands to another thing,” says Nesfield (1900) at the turn of the 20th century.

“A *preposition* is a word which governs a noun or a pronoun and connects it to anything else in the sentence or clause,” says Gwynne (2011), still plagiarizing the usual suspects after yet another hundred years.

Grammar books down the centuries simply reiterate what they take to be ancient wisdom, paraphrasing whatever the last one said, rather than engaging critically in the investigation of grammar.

The definitions in the chain of plagiarized statements we have quoted are factually indefensible. Uncontroversial prepositions like *at, from, of, on, until*, and many others can clearly be followed not only by NPs but also in some cases preposition phrases (PPs), adjective phrases, adverb phrases, and several different kinds of clauses. Consider the boldfaced prepositions in these examples:

*It came **from** under that couch.* (preposition phrase)
*She didn't realize this **until** recently.* (adverb phrase)
*He's been depressed **since** leaving the city.* (gerund-participial clause)
*They couldn't agree **on** what to buy.* (infinitival interrogative clause)
*It depends **on** how much you can pay.* (interrogative clause)
*I'm aware **of** what a shock this will be.* (exclamative clause)

It is also clear that words like *in, up, down, over, through*, etc., are sometimes not followed by a noun (or NP) or anything at all:

*Soon they went **in** the house.* *Soon they went **in**.*
*He came running **up** the street.* *He came running **up**.*
*Does this hole go **right through** the wall?* *Does this hole go **right through**?*
*They like to run **around** the yard.* *They like to run **around**.*

To take account of such facts, traditional grammars posit that for a substantial subset of the prepositions there are homophonous and virtually synonymous doppelgangers belonging to other categories. Nesfield (1900: 41) warns the student that a preposition “must not be confounded with an Adverb, though the two words are often identical in form.” (Essentially

identical in meaning as well, he could have added.) “The only way to distinguish them,” he continues, “is to look to the *work that each of them does*.” This is a fully explicit confusion of function with category: an adverb “qualifies” (i.e. modifies) only one element in the sentence, while a preposition affects two, Nesfield claims. So *about* is a preposition in *walked about the field* but not in *walked about; down*; *down* is a preposition in *float down the stream* but not in *float down*; and so on.

The analysis then acquires another layer of implausibility when it is revealed (Nesfield, p. 47) that for an overlapping subset of these prepositions that have adverb homophones there are additional homophones in the ‘subordinating conjunction’ category: *before* is acknowledged as a preposition in *before her court appearance*, but not in *before she appeared in court*, where what follows it is a declarative content clause.

No semantic, morphological, or phonological evidence offers any support for having three different lexemes spelled *before*. Yet in traditional grammars, and in every published dictionary we are aware of, this is what is done. *Before* is claimed to be a preposition in *I never saw her before her court appearance*, but a ‘subordinating conjunction’ in *I never saw her before she appeared in court*, and an adverb in *I never saw her before*. In each case, *before* heads a phrase functioning as a temporal Modifier; the pronunciation is the same, the morphology is the same (it is uninflectable), and the meaning is the same (in its temporal sense, it refers to the period preceding a designated point in time identified either by the interpretation of its Complement or by the context when it has no Complement).

Following cogent but long-neglected arguments by Hunter (1784), Jespersen (1924), Geis (1970), Emonds (1972), and Jackendoff (1973, 1977), *CGEL* treats words like *after* and *before* as prepositions not only when they have an NP in Complement function but also when the Complement is a clause, or when there is no Complement.

This amounts to extending **subcategorization** (the classification of lexical heads according to what categories can function as their Complement: see Chomsky 1965, section 2.3.4) to prepositions, instead of restricting it to verbs, nouns, and adjectives.

CGEL also notes that adverbs can take Complements. Jackendoff (1977:78) treats the fact that adjectives take Complements as the key factor differentiating them from adverbs, which he says “on the whole” do not. He argues (unconvincingly) that *unfortunately for our hero* is not an exception. But in fact there are several classes of adjective-derived adverbs that take a PP as Complement in the same way as the related adjectives:

<i>independently <u>of these considerations</u></i>	(<i>of</i> -PP Complement)
<i>differently <u>than anyone else had</u></i>	(<i>than</i> -PP Complement)
<i>similarly <u>to its counterparts in other industries</u></i>	(<i>to</i> -PP Complement)
<i>separately <u>from the rest of the company</u></i>	(<i>from</i> -PP Complement)
<i>simultaneously <u>with the rebellion in the south</u></i>	(<i>with</i> -PP Complement)
<i>luckily <u>for you</u></i>	(<i>for</i> -PP Complement)

The classes of adjectives that take Complements are much larger than the corresponding classes of adverbs, but it cannot seriously be doubted that the examples above involve Complements of adverbs (within \bar{X} , in Jackendoff’s terms).

8. Subordinate clause types

The traditional analysis of finite subordinate clauses distinguishes three subcategories which are supposed to be syntactically analogous to the lexical categories noun, adjective, and adverb. ‘Noun clauses’ are supposed to be the ones that can serve as Subjects and Objects the way NPs do; ‘adjective clauses’ are those that (like adjectives) modify or qualify nouns; and ‘adverb clauses’ are clauses that, like adverbs, modify or qualify verbs.

The analogies that lie at the root of this analysis are entirely spurious. We summarize the reasons briefly here (for a fuller account see Huddleston and Pullum 2004).

To begin with, the putative subcategories overlap: indefinitely many clauses have to be treated as belonging to two distinct subcategories. In *I was told that I kissed her* the underlined subordinate clause would be classified as a ‘noun clause’ because it is analogous to the Object of *tell* in *I was told a lie*. But in *I was so bold that I kissed her* an identical clause would be classified as an ‘adverb clause’ of result.

The classification errs in trying to attribute to the clauses themselves what is really a difference in the functions that a subordinate clause can serve: in *CGEL*’s terms, the difference between Complement and Modifier. Classifying *that I kissed her* as belonging to two different subcategories of clause is as misguided as putting *one hour* in two different subcategories of NP because of *I need one hour* (where it functions as an Object) and *It happened one hour later* (where it is a Modifier of *later*).

The traditional analysis of subordinate clauses is intimately linked to a miscategorization of prepositions when they take clause Complements. When a word like *after* is followed by a finite clause, the traditional account holds that it is a ‘subordinating conjunction’ introducing an ‘adverb clause’. But it is distinctly embarrassing for such an analysis that the alleged ‘adverb clause’ introduced by *after* appears in exactly those contexts where you can find a PP headed by *after*, and nowhere else:

I didn’t have any contact with him after he resigned.
I didn’t have any contact with him after his resignation.

After he divorced, he bought a yellow Lamborghini.
After his divorce, he bought a yellow Lamborghini.

Why would this be? Phrases headed by the noun *crease* and the verb *crease* have totally different distributions. Why would PPs headed by the preposition *after* and ‘adverb clauses’ introduced by a homophonous ‘subordinating conjunction’ *after* have identical distributions?

The traditional account is simply wrong to stipulate that finite clauses cannot combine with prepositions. And once we see that *after he resigned* is best treated as a PP, it is easy to see that the same holds for *although she didn’t mean it*, *because you’re mine*, *before I met you*, *since you left me*, *though nobody knew*, *unless you come back*, etc.: they are all best treated as PPs.

CGEL does not treat all the traditional ‘subordinating conjunctions’ as prepositions, however. (Emonds 1985 does try to motivate a full unification of subordinators with prepositions; we disagree.) The unstressed clause-introducing word *that* does not behave like a preposition. It is a meaningless subordinating marker for declarative subordinate clauses, and unlike prepositions, it is freely omissible in the most typical context for such clauses, immediately following a verb (see *CGEL* 952–4). Its interrogative counterpart *whether*,

though not omissible, is in many contexts replaceable by an informal-style alternant, interrogative *if*, as in *I wonder if it's true*.

CGEL categorizes these words, along with a few others (e.g. the *for* of *for it to rain*) as **subordinators**. The difference between *it wasn't there* and *that it wasn't there* is the difference between a **bare** finite content clause and an **expanded** one. (Most of the prepositions taking clause Complements take bare finite clauses, but not all: *except*, *given*, *notwithstanding*, and *provided* can take expanded clauses with the subordinating marker, as in *It's OK, except that it's pink*.)

Turning now to the analogies with lexical categories on which the traditional classification of subordinate clauses is based, we find that they collapse rapidly on even casual inspection.

Noun clauses clearly do not have distributions anything like that of nouns or NPs. With verbs one might be tempted to see an analogy between clauses as Complement and NPs as Object (e.g. to see *I regret that I lied* as parallel to *I regret my lie*), but clauses are also found as Complement with adjectives, virtually none of which can take NPs (*I'm sorry that I lied* vs. **I'm sorry my lie*),⁴ and as Complement of a noun. (Nouns never take following NP Complements; compare *my regret that I lied* vs. **my regret my lie* or *my hope that he'll fail* vs. **my hope his failure*, and so on.)

One sidestepping move would be to posit 'suppressed' prepositions in such cases: to treat *We're pleased that they applauded* as parallel to *We're pleased at their reaction*, but with a suppressed *at*. The trouble is that there are cases like *I'm afraid you're wrong*, where there is no possible PP to analogize from (**I'm afraid {of / at / over / with / from} your error*). Gould Brown (1851:597) comments astutely on hypothesizing underlying elements that cannot appear overtly: "where it cannot be inserted without *impropriety*, it is absurd to say, that it is 'understood'." We concur. It has to be recognized that different nouns, verbs, adjectives, and prepositions licence different categories of Complement, and their variety cannot be reduced.

Further evidence against the traditional notion of 'noun clause' comes from extraposition constructions with adjectives like *clear*, *evident*, *obvious*, etc., in which so-called 'noun clauses' can appear but NPs cannot:

That the residents don't care is clear. *It's clear that the residents don't care.*
The residents' apathy is clear. **It's clear the residents' apathy.*

As for 'adjective clauses', the traditional view is that because *man* can be modified by either *misogynistic* or *who hates women*, it follows that the latter clause is like an adjective. But of course it has essentially none of the syntactic properties of adjectives: it cannot precede the noun attributively, it cannot appear predicatively, it does not take degree or comparison Modifiers like *very* or *more*, and so on.

In short, there is no merit in the traditional attempt to derive the syntactic properties of finite subordinate clauses by positing functional equivalence with nouns, adjectives, or adverbs.

⁴ *Worth* is one example of the extremely rare case of an adjective taking an NP Complement; but it happens not to take finite clause Complements.

CGEL classifies finite subordinate clauses on the basis of their internal structures instead. The basic division is between **content clauses**, **relative clauses**, and **comparative clauses**. Content clauses are much like independent clauses, except that (i) they are never imperative, (ii) they may be marked by subordinators, and (iii) the interrogative type does not exhibit auxiliary-before-Subject structure in Standard English (we find *I wonder who it is* and *She asked if she could* rather than **I wonder who is it* and **She asked if could she*).

Relative clauses are similar except that they obligatorily contain a ‘gap’ — an unfilled NP or PP position — and they may have an introductory relative phrase like *which* or *who*. Relative clauses are illustrated by the underlined parts of these phrases (where the ‘gap’ location is shown for expository purposes by ‘ \emptyset ’):

the book which he was reading \emptyset

the book that he was reading \emptyset

the book he was reading \emptyset

Comparative clauses, appearing mainly as Complement to *as* or *than*, also have reduced internal structure: in *You’re nearly as tall as she is \emptyset* the predicative constituent normally needed to follow *is* is missing, and in *I’ve read more books than you’ve had \emptyset hot dinners* the quantificational Determiner for *hot dinners* is understood (it denotes the number of hot dinners you’ve had), but is obligatorily absent. (Notice that inserting one causes ungrammaticality: **I’ve read more books than you’ve had many hot dinners.*)

Relative clauses and comparative clauses have to be distinguished both from content clauses and from each other. The distinguishing properties are real, and involve differences in internal syntactic structure which have correlates in external distribution; syntactic generalizations are captured if we classify subordinate clauses in this way. None of this can be said about the traditional classification.

9. Discourse and information presentation

For many linguists the most interesting areas of syntax lie in the structure of constructions showing sensitivity to discourse context: preposing, postposing, clefts, existentials, passives, and so on. It is remarkable how little interest traditional grammarians showed in such phenomena: most of them (passives being an exception) are barely mentioned. *CGEL* (Ch. 16) describes them in detail and stresses their role in the packaging and presentation of the information conveyed by a sentence. These constructions have very clear syntactic properties that in our view are not simply common-sense consequences of natural communicative inclinations or situations.

Crucially, the differing word orders in these constructions cannot be treated as a matter of speaker’s discretion. In Saussure’s terminology, they cannot be regarded as **parole**, rather than **langue**. There are intricate and quite specific syntactic constraints, many of which were never appreciated until transformational-generative work brought them to light in the 1960s and 1970s.

A relatively simple example is provided by the construction often (but inappropriately) called ‘topicalization’, referred to in *CGEL* as **Complement preposing**. It is illustrated by these roughly synonymous sentences:

His latest article, I certainly liked.

I certainly liked his latest article.

The word order difference between the two might superficially seem to be a matter of mere whim: the speaker chooses to produce one of the NPs before uttering the rest of the sentence. That would be the parole view. It is clearly wrong.

In *CGEL* terms the first of the above examples has *his latest article* in Prenucleus function, while the latter has it in VP-internal Complement function, and there are numerous syntactic conditions that the sentence has to meet. When a constituent appears in Prenucleus function, the accompanying clause has a ‘gap’, i.e. an unfilled function within its structure, not necessarily in the same clause. It may be within a PP, leaving a stranded preposition; it may be within the VP of a subordinate clause leaving a transitive verb with no Direct Object; it may leave a stranded preposition inside a PP in a subordinate clause; there are indefinitely many possibilities:

- Some of his jokes [they definitely laughed at ∅].* (gap in PP within clause)
- Some of his jokes [I think [the crowd enjoyed ∅]].* (gap in VP in clause within clause)
- Some of his jokes [I think
[the crowd definitely laughed at ∅]].* (gap in PP within clause
within clause)
- Some of his jokes [I imagine [his colleagues might
decide [they think [he should apologise for ∅]]]].* (gap in PP within clause within
clause within clause within clause)

Yet there are syntactic limitations on where the gap may be. It can be (understood as) the Subject of an embedded content clause, but not as a Subject that immediately follows a subordinator, or a Coordinate within a coordination, or a constituent contained within one Coordinate of a multiple coordination:

- Some of his jokes I think [∅ appalled them].*
(the gap is the subject of a bare content clause: grammatical)
- *Some of his jokes I think [that ∅ surprised them].*
(the gap is a subject immediately following subordinator: ungrammatical)
- *Some of his jokes I think they enjoyed [∅ and the music].*
(the gap is in a coordinate of the underlined NP coordination: ungrammatical)
- *Some of his jokes I think [they ignored most of the lecture but enjoyed ∅].*
(the gap is in a coordinate of the underlined VP coordination: ungrammatical)

These are syntactic constraints applying to the entire range of unbounded dependency constructions. Figuring out the exact statement of such constraints is a subtle and complex matter. Some effects that have been assumed to be syntactic may in fact be psycholinguistic rather than purely linguistic; the work of Hofmeister and Sag 2010, for example, shows that certain processing difficulties have sometimes been mistaken for evidence of syntactic constraints.

Furthermore, a clause with preposing cannot be deployed in a discourse in the same ways as its more basic counterpart. A sentence such as *Your latest article I certainly liked* would be bizarre as the opening sentence of a conversation, for example. Complement preposing is

appropriate where it picks up on a topic just introduced or highlights some kind of a focused contrast with some similarly preposed constituent. In this sentence we see both factors at work:

I'm afraid I wasn't able to be complimentary about all of his work; his book I liked a lot, but his most recent article I regarded as unconvincing.

Drawing on a large literature of modern work (often described as ‘functionalist’),⁵ *CGEL* discusses a variety of other constructions in the context of their discourse-sensitive information-packaging roles: postposing (*Turning around, he saw on the desk a gun*); inversions of Subject and Dependent (*There goes the neighbourhood*); existential clauses (*There was a full discussion*); extraposition (*It amazes me that you haven't left him*); dislocations (*He's quite a handful, our Jimmy*), clefts (*It was only later that we figured it out*), and the various constructions known as passives, together with the pragmatic conditions favouring or disfavouring their use. One lesson to be drawn from them (well understood by proponents of every modern theory of grammar) is that there are complex syntactic and pragmatic conditions that are part of what one has to command in order to be a competent English speaker, conditions that traditional grammars said virtually nothing about. For further discussion, see Kaltenböck (this volume).

10. Theoretical considerations

A central point about the implicit theory underlying *CGEL* concerns the nature of the objects used as representations of syntactic structure. Syntactic representations in GPSG are ordered, node-labelled trees. Transformational-generative grammar (including Chomskyan minimalism) is vastly less restrictive, in that it assumes ordered sequences of such trees, known as derivations. *CGEL*'s assumptions are considerably closer to those of HPSG and LFG. Although it would be a very complex matter to compare these frameworks in full detail, what is implicitly held in common between them is the idea of using graphs that are connected and have a unique root and disjoint label sets for nonterminal (interior) and terminal (frontier) nodes, but which depart from using ordinary constituent-structure trees in two key respects.

First, in all three frameworks, the labelling is richer. Grammatical functions appear overtly in representations alongside categories like ‘verb’ or ‘noun phrase’. Whereas with normal trees it is just the vertices (nodes) that are labelled, the inclusion of function labels as well as category labels is probably best understood formally in terms of tree-like graphs with category labels at the nodes and, in addition, function labels on the edges (the lines that connect certain pairs of nodes). For typographical convenience, the diagrams in *CGEL* (see Figure 1) utilize the notation — first used, as we mentioned earlier, in tagmemics — where the function labels are moved down the edges (away from the root) to the dominated node and shown prefixed to the category label with a colon as separator. A *CGEL* diagram depicting a clause node immediately dominating a node labelled ‘Subject:NP’ (intuitively representing an NP functioning as the Subject of a clause) is merely a different visual presentation of a graph in which the edge from the clause node to the NP-labelled node is labelled ‘Subject’. But for purposes of assessing complexity of the description we can treat

⁵ See e.g. Mackenzie, this volume, and Birner and Ward (1998). Ward and Birner coauthored Chapter 16 of *CGEL* with Huddleston.

‘Subject:NP’, for mathematical linguistic purposes, as an unanalysable unit. The function labels on lines can be eliminated to make an equivalent analysis using ordinary trees with a larger inventory of node labels.

Second, nodes may in effect be shared between distinct parts of the graph: the continuous expansion of branching of trees is not required, and a node can have two distinct edges each connecting it to nodes closer to the root. This is called double-motherhood in Hudson (1976:76–79); ‘overlapping arcs’ in relational grammar and its descendants such as the arc pair grammar of Johnson and Postal (1980); ‘structure sharing’ in Pollard and Sag (1994);⁶ multiattachment in various other works; and so on.

CGEL’s use of such departures from trees is less extensive than is found in either HPSG or LFG: the representations are considerably closer to being trees. Payne, Huddleston and Pullum (2007) provide a detailed exposition and illustration with some new applications of what they call **function fusion**. The phenomena calling for function fusion all relate to material before the head noun in NPs:

- (i) Most determinatives can stand alone as NPs: *all, each, few, many, most, none, several, some, that, this*, etc. *CGEL* posits that in such cases the determinatives bear two functions, serving as Determiner and Head simultaneously. This applies to the underlined determinatives in sentences like *All* *are included here*; *None* *were saved*; *Several* *decided not to bother* (see Figure 2, where D = determinative and Comp = Complement).

PUT FIGURE 2 ABOUT HERE

- (ii) Many adjective phrases can appear in NPs with the definite article but no head noun, being interpreted as if they had a head noun with either human (plural) or abstract generic sense: *The poor* *are always with us*; *He respected even the humblest of them*; *I blame the French for this*; *It’s a leap into the utterly unknown*; *You’re the first*; *Only the very young believe that*. *CGEL* treats these as cases of an adjective phrase taking on the function of Head in addition to the function of Modifier (again, see Figure 2).
- (iii) Some determinatives (or determinative phrases like *hardly any*) can serve as Determiner of an NP and simultaneously Head of its head nominal, where the nominal also immediately dominates a dependent; this is found in *someone* *I know* or *few of her friends* (the latter is diagrammed in Figure 2).
- (iv) In relative constructions such as the underlined NP in *What she wrote* *shocked everybody*, the initial *what* is analysed as both the Head of the nominal in an NP and the Prenucleus *wh*-phrase of a relative clause within that nominal (see Figure 3).

PUT FIGURE 3 ABOUT HERE

⁶ We are ignoring purely notational matters here. Pollard and Sag choose to represent tree structure using attribute-value matrices, i.e. complex nested labelled bracketings, with numerical tags indicating structure sharing. But those are equivalent to graphs of a certain sort with nodes and lines labelled.

Payne, Huddleston and Pullum (2007) propose another application, in which a determinative phrase has both Modifier and Head functions in an NP (see the discussion of *this once* and *the more than once which would have been permitted* on pp. 588–591). See Figure 4.

[PUT FIGURE 4 ABOUT HERE]

The departure from tree structures constituted by the uses of function fusion in *CGEL* is actually very slight, in a sense that can be made formally precise. Using the metaphor of parenthood for immediate dominance, using the terms ‘parent’ and ‘grandparent’ in the obvious way, we can say that a constituent with fused functions either bears both functions to its parent node (as in *several* and *the very young*) or bears them to its parent and grandparent respectively (as in *few of her friends* and *what she wrote*).

This tight limitation on the use of function fusion, together with certain other elementary conditions that seem very likely always to be met in syntactic analyses of English, permit Pullum and Rogers (2008) to argue that the expressive power of *CGEL*’s grammatical description in terms of partially tree-like graphs is the same as it would be if trees had been employed throughout. That is, it seems fairly clear that languages describable using *CGEL*’s assumptions and representations could be given an essentially equivalent description using trees if this were desired.⁷

The use of node-sharing representations that is made in *CGEL* is thus purely a heuristic decision, enabling certain generalizations to be captured more perspicuously. If necessary for some theoretical or computational purpose, a strongly equivalent description could be given entirely in terms of rather simple constraints on trees, and it would be compatible with a fairly restrictive view of the expressive power of grammatical theory.⁸

11. Conclusion

The many failings of traditional grammar are little recognized outside linguistics departments. And the work of the past 60 years in modern theoretical linguistics has had no impact on the general public’s understanding. *CGEL* takes an approach to the description of English that owes a certain amount to each but follows neither. Its conception was in part inspired by previous large-scale efforts such as Quirk et al. (1985), and in part informed by the vast body of discoveries about syntax made during the 20th century. It offers a relatively informal and well-illustrated description of English grammar based on consistent

⁷ The conditions that must be assumed are made explicit in Pullum and Rogers (2008). The key point is that nothing in *CGEL* seems to entail any condition that could not be stated using monadic second-order logic (or even first-order logic) interpreted on trees. This entails that the set of all well-formed trees could in principle be recognized by a finite-state tree automaton. For discussion of the relevant mathematical background see Pullum (2012, section 3).

⁸ Of course, *CGEL* deals with just a single lightly inflected SVO language. More elaborate frameworks like LFG aim to cover the entire range of human languages. As is made very clear in Bresnan et al. (2016), LFG is aiming for a flexibility that permits the description of many with radically different typologies (their language index has more than 60 entries). We make no claims at all here concerning universal applicability for the mechanisms posited in *CGEL*’s description of English.

terminology and theoretical assumptions, and provides detailed coverage of the full array of facts that any adequate grammar of English would have to deal with.

This chapter has stressed in particular some of the important departures from traditional presentations over the past 400 years: recognizing the status of phrases in the modern sense; folding pronouns in as a special subcategory of nouns; treating auxiliaries as a special subcategory of verbs; separating the category of adjectives from both the small category of determinatives and the broader class of items that can function as Modifier; delimiting prepositions in a way that recognizes the different Complements they can take but also separates them from the very small category of subordinators; classifying subordinate clause types in a way that is based on their internal structural properties; and making explicit the ways in which a number of syntactic constructions are sensitive to discourse and information structure.

We have also briefly touched on the technical details of the implicit syntactic theory behind *CGEL*, best visualized as involving conditions imposed on structural representations that take the form of node-labelled, edge-labelled, almost-treelike graphs of a certain type. In the space we have here it has not been possible to consider even briefly the ways in which the syntax of English must ultimately be integrated with the details of its morphology, phonology, and semantics. We have, however, given some indications of how the implicit theory underlying our description relates to current non-transformational theoretical frameworks for syntax like HPSG and LFG.

References

- Bloomfield, Leonard. 1933. *Language*. New York: Holt.
- Bresnan, Joan; Ash Asudeh; Ida Toivonen; and Stephen Wechsler. 2016. *Lexical-Functional Syntax*. Second edition. Chichester: Wiley Blackwell.
- Bullokar, William. 1586. *Pamphlet for Grammar*. London: Henry Denham.
- Brown, Gould. 1851. *The Grammar of English Grammars*. New York: Samuel S. and William Wood.
- Chomsky, Noam. 1957. *Syntactic Structures*. The Hague: Mouton.
- Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge MA: MIT Press.
- Chomsky, Noam. 1970. Remarks on nominalization. In Roderick Jacobs and Peter S. Rosenbaum, eds., *Readings in English Transformational Grammar*, 184-221. Waltham, MA: Ginn.
- Cook, Walter A. 1969. *Introduction to Tagmemic Analysis*. New York: Holt Rinehart and Winston.
- Emonds, Joseph E. 1972. Evidence that indirect object movement is a structure-preserving rule. *Foundations of Language* 8: 546–561.

- Emonds, Joseph E. 1985. *A Unified Theory of Syntactic Categories*. Dordrecht: Foris.
- Fries, Charles C. 1952. *The Structure of English*. New York: Harcourt Brace.
- Gazdar, Gerald, Geoffrey K. Pullum, and Ivan A. Sag. 1982. Auxiliaries and related phenomena in a restrictive theory of grammar. *Language* 58: 591–638.
- Gazdar, Gerald, Geoffrey K. Pullum, and Ivan A. Sag. 1985. *Generalized Phrase Structure Grammar*. Oxford: Blackwell.
- Geis, Michael. 1970. *Adverbial Subordinate Clauses in English*. Ph.D. thesis, MIT.
- Gwynne, N. M. 2011. *Gwynne's Grammar: The Ultimate Introduction to Grammar and the Writing of Good English*. London: Idler Books.
- Harris, Zellig S. (1951) *Methods in Structural Linguistics*. Chicago: University of Chicago Press.
- Harvey, Thomas W. 1868. *A Practical Grammar of the English Language for the Use of Schools of Every Grade*. New York and Cincinnati: Van Antwerp, Bragg & Co. (Revised edition 1878.)
- Hofmeister, Philip and Ivan A. Sag. 2010. Cognitive constraints and island effects. *Language* 86: 366–415.
- Huddleston, Rodney and Geoffrey K. Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- Huddleston, Rodney and Geoffrey K. Pullum. 2004. The classification of finite subordinate clauses. In Gunnar Bergh, Jennifer Herriman, and Mats Mobärg (eds), *An International Master of Syntax and Semantics: Papers Presented to Aimo Seppänen on the Occasion of his 75th Birthday* (Gothenburg Studies in English, 88), 103–116. Göteborg, Sweden: Acta Universitatis Gothoburgensis.
- Huddleston, Rodney D. 1976. Some theoretical issues in the description of the English verb. *Lingua* 40: 331–383.
- Huddleston, Rodney D. 1984. *Introduction to the Grammar of English*. Cambridge: Cambridge University Press.
- Huddleston, Rodney D. 1988. Review of Quirk et al. (1985). *Language* 64: 345–354.
- Hudson, Richard. 1976. *Arguments for a Non-transformational Grammar*. Chicago: University of Chicago Press.
- Hudson, Richard. 2010. *An Introduction to Word Grammar*. Cambridge University Press.

- Jackendoff, Ray S. 1973. The base rules for prepositional phrases. In Stephen R. Anderson and Paul Kiparsky, eds., *A Festschrift for Morris Halle*, 345–356. New York: Holt Rinehart and Winston.
- Jackendoff, Ray S. 1977. *X̄ Syntax*. Cambridge, MA: MIT Press.
- Jespersen, Otto. 1909–1949. *A Modern English Grammar on Historical Principles*. London: George Allen and Unwin.
- Jespersen, Otto. 1924. *The Philosophy of Grammar*. New York: Holt.
- Johnson, David E. and Paul M. Postal. 1980. *Arc Pair Grammar*. Princeton, NJ: Princeton University Press.
- Klima, Edward S. 1965. *Studies in Diachronic Syntax*. Ph.D. thesis, MIT, Cambridge, MA.
- Levine, Robert D. 2017. *Syntactic Analysis: An HPSG-based Approach*. Cambridge University Press.
- Linn, Andrew. 2006. English grammar writing. Chapter 4 of *The Handbook of English Linguistics*, ed. by Bas Aarts and April McMahon, 72–92. Oxford: Basil Blackwell.
- Longacre, Robert E. 1965. Some fundamental insights of tagmemics. *Language* 41: 65–76.
- Lowth, Robert. 1762. *A Short Introduction to English Grammar*. London: A. Millar and R. & J. Dodsley.
- Murray, Lindley. 1795. *English Grammar Adapted to the Different Classes of Learners*. York: Thomas Wilson and Sons.
- Nesfield, J. C. 1900. *Outline of English Grammar*. London: Macmillan.
- Payne, John; Rodney Huddleston; and Geoffrey K. Pullum. 2007. Fusion of functions: The syntax of *once*, *twice*, and *thrice*. *Journal of Linguistics* 43: 565–603.
- Perlmutter, David M. (ed.) 1983. *Studies in Relational Grammar I*. Chicago: University of Chicago Press.
- Pollard, Carl and Ivan A. Sag. 1994. *Head-Driven Phrase Structure Grammar*. Chicago: University of Chicago Press.
- Postal, Paul M. 1964. *Constituent Structure: A Study of Contemporary Models of Syntactic Description*. The Hague: Mouton.
- Pullum, Geoffrey K. (2013): The central question in comparative syntactic metatheory. *Mind and Language* 28 (4), 492-521.

- Pullum, Geoffrey and Deirdre Wilson. 1977. Autonomous syntax and the analysis of auxiliaries. *Language* 53: 741–788.
- Pullum, Geoffrey K. and James Rogers. 2008. Expressive power of the syntactic theory implicit in *The Cambridge Grammar*. Presented to the Linguistics Association of Great Britain (online at <http://www.lel.ed.ac.uk/~gpullum/EssexLAGB.pdf>).
- Ross, John R. (1969). Auxiliaries as main verbs. In W. Todd (Ed.), *Studies in philosophical linguistics* (Series 1). Evanston, IL: Great Expectations Press (online at <http://www-personal.umich.edu/~jlawler/haj/AuxasMV.pdf>).
- Quirk, Randolph; Sidney Greenbaum; Geoffrey Leech; and Jan Svartvik. 1985. *A Comprehensive Grammar of the English Language*. London: Longman.
- Tieken-Boon van Ostade, Ingrid. 2011. *The Bishop's Grammar: Robert Lowth and the Rise of Prescriptivism in English*. Oxford: Oxford University Press.
- Wallis, John. 1653. *Grammatica Linguae Anglicanae*. Hamburg: Gotfried Schultzen.

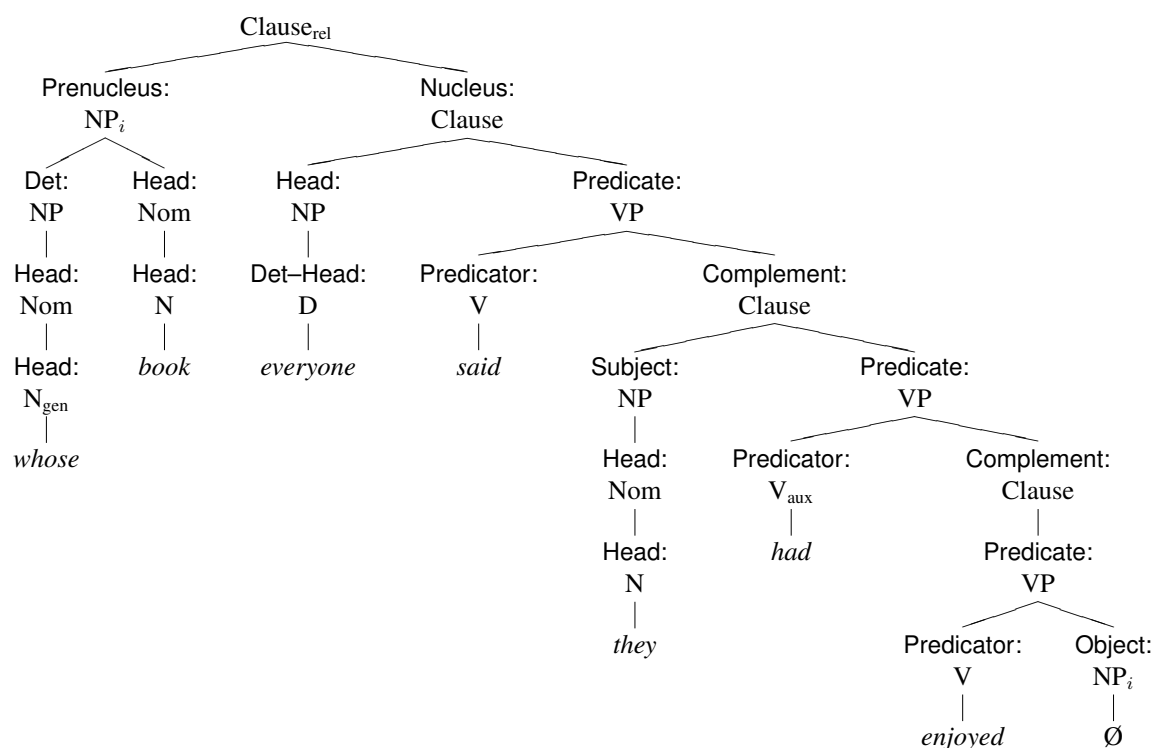


Figure 1: Structure of *whose book everyone said they had enjoyed*

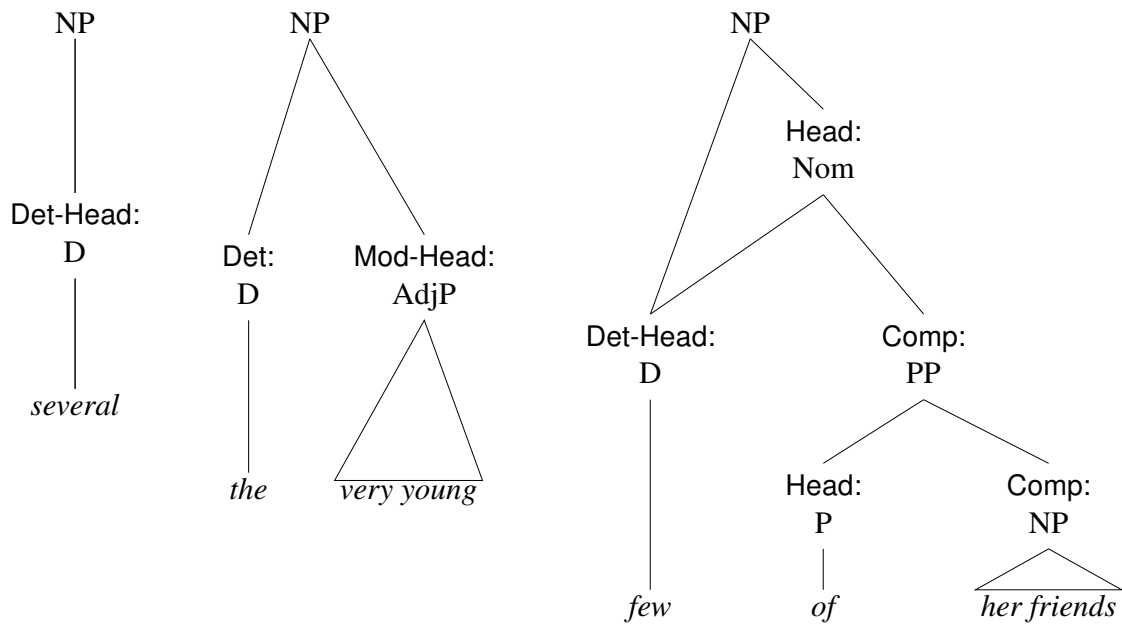


Figure 2: Diagrams of NPs with Determiner-Head and Modifier-Head function fusion.

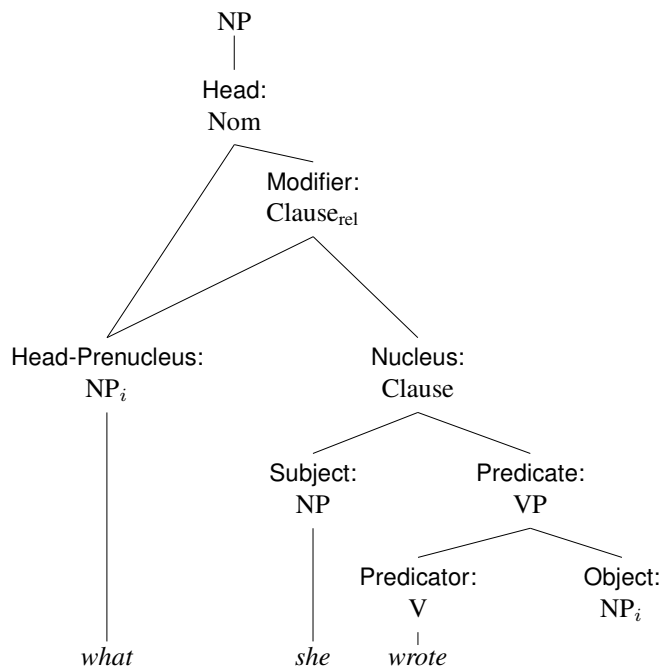


Figure 3: Diagram of a fused relative NP with Head-Prenucleus function fusion.

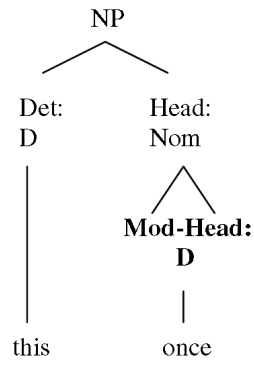


Figure 4: Diagram of a the noun phrase *this once* which contains a fused Modifier-Head. As the determinative phrase *once* contains only one word, the 'DP' level has been omitted here.