

Fusion of functions: The syntax of *once*, *twice* and *thrice*¹

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In this paper we present a detailed new analysis of the English expressions *once*, *twice* and *thrice*. These, we claim, are primarily compound determinatives, analogous in many respects to expressions like *someone* and *somewhere*. The new analysis exploits the framework of the *Cambridge grammar of the English language* (2002) in which the morphological nature of the compound determinative category reflects a fusion of functions, typically determiner (or modifier) and head of NP. We refine the notion of fusion of functions, and show that constructions which employ fusion of functions have properties which clearly distinguish them from superficially similar constructions which employ incorporation or hybridization. The paper therefore provides further evidence for the existence of fusion of functions as a distinct syntactic configuration, and indirectly supports theoretical frameworks which treat functions and categories as distinct primitives.

Dictionaries and grammars uniformly classify the *once* and *twice* of such examples as *I only met her once or twice* as adverbs. Huddleston & Pullum et al. (2002, henceforth *CGEL*) is no exception. However, a closer investigation of the distribution of these words leads to the proposal of a new analysis which reflects the relationship between them and the expressions *one time* and *two times*. We take this relationship to be comparable to that between *somebody* and *some person*, so that, at the phrasal level, *once* and *twice* in the above example are noun phrases (henceforth NPs).

In section 1 we outline and develop relevant aspects of the analysis of NP structure presented in *CGEL*. We begin with the analysis of fused relative constructions and conclude with the analysis of expressions like *somebody* as

[1] We wish to thank the anonymous *JL* referees for their useful comments on this and a previous version of this paper.

compound determinatives which function simultaneously as the determiner and head of NP. These analyses distinguish carefully between functions like ‘determiner of’ and categories like ‘determinative’, and permit, under restricted circumstances which we here explicitly define, the fusion of functions (henceforth FF).

In section 2 we then argue in detail for an analysis of *once* (in all but one of its uses) which invokes FF and in all essential respects parallels the analysis of *somebody*. Analogous analyses for *twice* and the somewhat archaic *thrice* follow straightforwardly in section 3. We then in section 4 discuss certain non-standard uses of *once* which lend further support to the FF analysis.

Finally, in section 5 we show that the constructions which we analyse using FF have properties which clearly demarcate them from superficially similar constructions such as incorporation, where a new grammatical word is formed by the incorporation of one category into another, and hybridization, where a head projects to a phrase of a distinct category. Hybrid constructions are found only marginally in English, but typically occur in event nominalizations in a variety of other languages. In such cases it can be argued that nominalizations (of category NP) are ultimately headed by a verb rather than a noun.

The new analysis therefore provides further empirical evidence for the existence of FF as a distinct syntactic mechanism, and hence lends support to descriptions, such as those found in *CGEL*, which postulate functions as independent constructs.

I. FUSION OF FUNCTIONS

The basic analysis of NP structure we assume in this paper is that presented in Payne & Huddleston 2002 (chapter 5 of *CGEL*). The first point to note is the systematic distinction in *CGEL* between functions and categories. At the topmost level, the basic distinction employed with respect to functions is that between head and dependent. In canonical constructions, dependents can then be subdivided into the more specialized subtypes of complement (Comp), modifier (Mod) and determiner (Det), this latter function being restricted in its occurrence to NPs only.² A further relevant case of the

[2] We follow *CGEL* in taking phrases like *the boxes* as being headed by the noun *boxes*. The determinative, *the*, we regard as having the function ‘determiner’; and the generalizations that we make about fusion of functions assign determiners the same dependent status as NP modifiers like attributive adjectives. The ‘DP hypothesis’ of Brame (1982) and Abney (1987) takes the view that *the* is a head. Arguments against this are given by Payne & Huddleston (2002), and we will not repeat them here. We actually believe that the FF analysis of *once* and similar items is not compatible with the ‘DP hypothesis’, or at least that the hypothesis renders it difficult to find an appropriate analysis. The reader should note that later on we do use the label ‘DP’, but for phrases headed by determinatives, and typically functioning as determiners. Thus a phrase like *almost every problem* is an NP for us, but the phrase *almost every* within it is a DP.

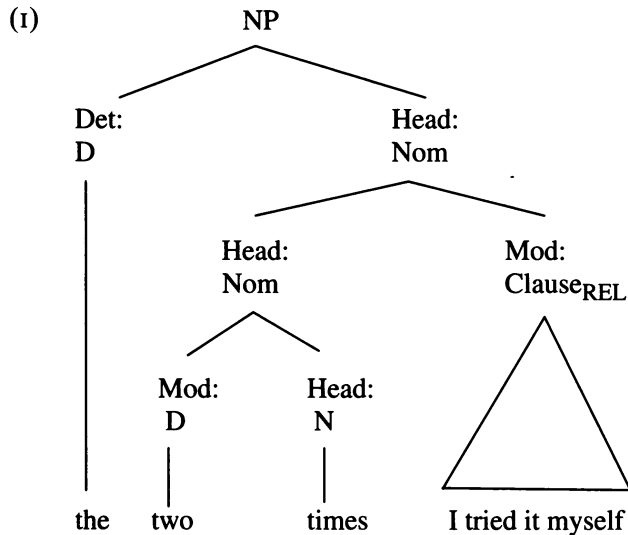
head-dependent relation, employed in non-canonical constructions involving fronting, is that between nucleus and prenucleus. The prenucleus is the (dependent) function of a fronted constituent such as a relative phrase, and the nucleus is the (head) function of the clause containing the corresponding gap. In the case of fronted relative phrases, the prenucleus function corresponds approximately to specifier of CP in other frameworks, although 'specifier' is generally construed as a structural position rather than as a function in the sense intended here.

On the other hand, the main categories assumed for English are the lexical categories of noun (N), verb (V), adjective (Adj), adverb (Adv), preposition (Prep), determinative (D), and a corresponding set of phrase-level projections. While Adj, Adv, Prep and D project simply to AdjP, AdvP, PP and DP respectively, N projects via the intermediate-level phrasal node Nom (=nominal) to NP, and V projects via the intermediate-level VP to Clause. The category N will then, in canonical NPs, function as what we call the ultimate head of NP. The category Nom corresponds approximately to the N' category in X-bar theory, but differs from this in that Nom can consist of a head noun and a modifier as well as of a head noun and a complement. Modifiers and complements in the *CGEL* framework are not defined in structural terms as dependents of different categories of head (e.g. complements as sisters of N and modifiers as sisters of N'). Nom therefore represents the first level of the phrasal expansion of N, whether this be by a complement or by a modifier.

An important instance of the distinction between function and category is the distinction between the function determiner and the word-category determinative.³ Although the determiner is characteristically realized by a determinative such as *the, a, this, some, any, one, two*, etc., it can also be realized by NPs – usually genitive, as in *this guy's shoes*, but sometimes plain, as in *what size shoes*. Conversely, while all determinatives can function as determiner, most can also appear in other functions too. Thus the demonstrative determinative *this* is determiner in *this size* but modifier in AdjP structure in *It's about this big*. Similarly, the cardinal numeral determinatives are determiners in *one time, two times*, but modifiers in *that one time, the two times I tried it myself*, where they are part of the head nominal determined by *that* and *the*.

[3] Note then that, like prenucleus, determiner is a function term, not a structural position such as 'specifier' in X-bar theory. Following Huddleston (1984: 97f.), *CGEL* (355f.), Aarts & Haegeman (2006: 140, fn. 7), we use 'determiner' as the function term and 'determinative' as the category term. Quirk et al. (1985: 283) use them in the opposite way, but we retain our usage because of the typical association between the suffix *-ive* and category (or sub-category) terms (cf. adjective, declarative, interrogative, imperative, exclamative, relative, nominative, accusative, etc.) and between *-er* and function terms (most notably, in the present context, modifier).

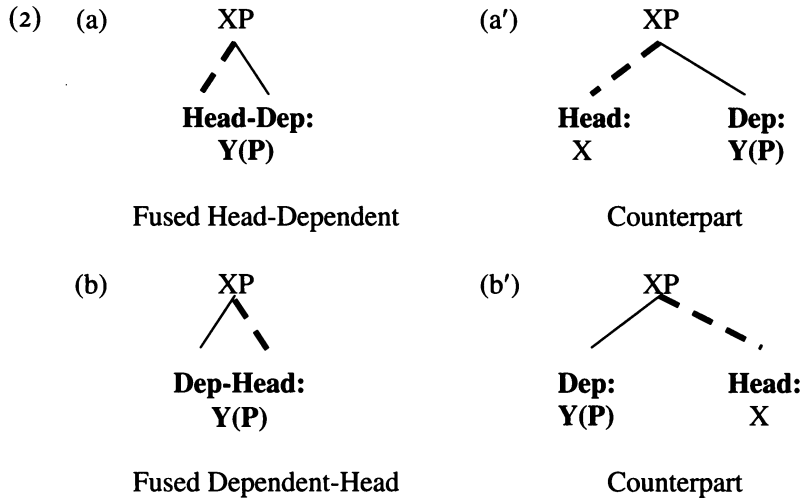
Structural diagrams in *CGEL* follow the convention of labelling each node with its function (upper line followed by a colon) and category (lower line). Thus the *CGEL* representation of the noun phrase *the two times I tried it myself* would be as follows (ignoring for simplicity the internal structure of the relative clause):



Here then NP consists of a head of category Nom and a determiner of category D (*the*). The noun *times* is the ultimate head, and there are two modifiers (*two* and *I tried it myself*). Note also that, as in *CGEL*, we conventionally simplify diagrams by representing lexical categories in basic dependent functions which can in principle project to higher phrasal levels, but in the given example fail to do so, simply by their lexical category label. The modifier *two*, for example, is conventionally labelled D rather than DP.

The grammatical framework used in *CGEL* also allows for the fusion of two functions (FF), i.e. for two functions which are realized canonically by discrete expressions to be realized jointly by a single expression in certain constructions. There are two cases: a simple case and a complex case. In the simple case, FF involves the fusion of a head function and an immediate dependent function (by which we mean a determiner, complement or modifier of that head or of its phrasal projections). This case is schematically represented with head-dependent order in (2a) and dependent-head order in (2b). The fused functions are indicated by writing a hyphen between them (e.g. 'Head-Dep'):

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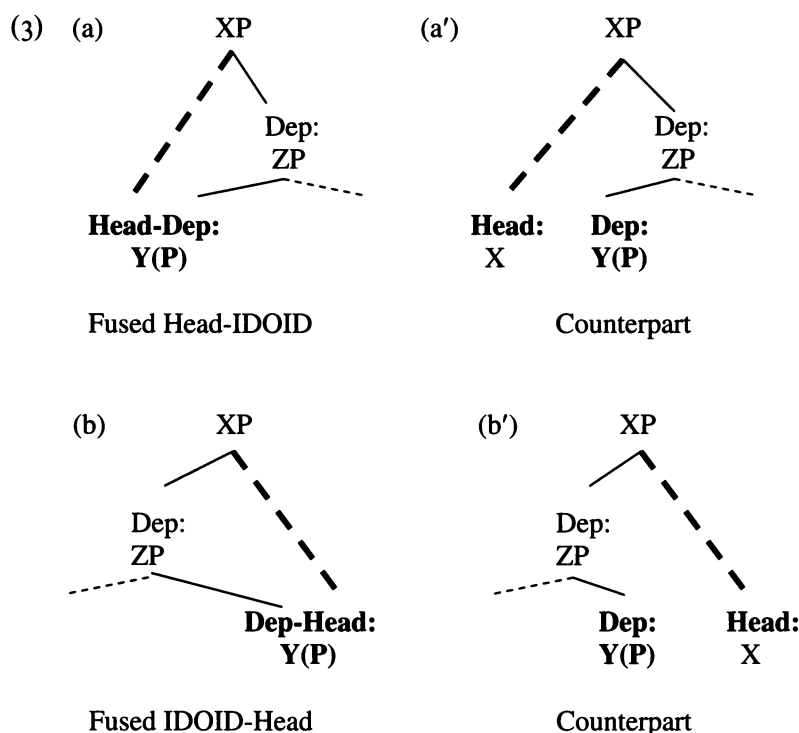


The path above the fused node from Head to XP may contain any normally licensed intermediate heads, and we indicate this by representing this head projection as a bold dashed line. For example, in the case where $XP = NP$, a Nom head may intervene between the fused head and NP in (2a) and (2b), and similarly between the head N and NP in the counterpart constructions (2a') and (2b'). As can be seen, at the fused node, the category which realizes the fused functions need not belong to the expected category X (and quite typically does not). Instead, it may be a lexical category Y or any licensed phrasal projection of Y. The ultimate head of XP will therefore be Y rather than X. The fused node can thus be thought of as a point in the normal path of headedness at which there can be a change of category (a property of FF which is shared with hybrid constructions, as shown in section 5 below). There will, however, still be an unbroken path of headedness from Y to XP, and in this sense FF constructions, like hybrid constructions, might be considered endocentric rather than exocentric.

It should be noted that we regard constructions with FF as constructions in their own right, licensed by independent rules governing well-formed structures. Nevertheless, for the majority of the constructions discussed in this paper, there exists a canonical counterpart construction without FF which is structurally similar in that (i) it is dominated by the same category XP, where XP is in principle any phrasal category including the intermediate category Nom, and (ii) the category of the fused node is the same as that of the dependent in the counterpart (see (2a') and (2b') above). In order to highlight these correspondences in the structural diagrams in this paper, fused functions and their category will be shown in bold face, as will be the corresponding functions and the category of the dependent in the

counterpart construction.⁴ It should be noted, however, that, although the FF and counterpart constructions may share these structural similarities, they frequently differ in other respects, e.g. distributionally or semantically, and in some cases no counterpart even exists. We do not therefore wish to construe FF constructions as related to their counterparts in derivational terms.

In the complex case, FF involves not a head and its immediate dependent, but rather a head and an immediate dependent of an immediate dependent (IDOID). This case is represented schematically in (3a) and (3b), with the corresponding counterpart constructions in (3a') and (3b'):



It is particularly obvious from the complex case that the structural diagrams required for FF represent in one sense a violation of what Sampson (1975) calls the single mother condition. Although each fused function in principle has its own mother (in the simple case the two mothers happen to coincide), the single category which realizes them will in effect have two mothers. This is the major departure from canonical principles of structure which FF

[4] In order further to highlight the correspondences between FF and counterpart constructions, we do not employ in this paper the *CGEL* convention whereby diagrams in which fused functions are sisters are simplified by drawing a single line from the mother category. Rather, we draw a separate line to each function.

entails. The second departure is of course the possibility noted above that a phrasal constituent of category XP may have a category other than X as its ultimate head. As already noted, this second departure will be independently required in the case of hybrid constructions. Otherwise, standard structural conditions obtain. In particular, there is no weakening of any prohibition against crossing branches, and this will have the useful consequence that fused functions are automatically adjacent.⁵

In sum, therefore, we associate the following general properties with FF:

- (i) In FF, a single lexical or phrasal category Y(P) simultaneously realizes two functions.
- (ii) FF is permitted in a category XP only between the head of XP and either an immediate dependent of XP or an immediate dependent of the immediate dependent of XP.
- (iii) The fused functions are adjacent.
- (iv) The category Y(P) is typically not identical to XP.

Comparison with the counterpart constructions suggests two further properties:

- (v) The category XP is a projection of the category of the ultimate head in any counterpart construction.
- (vi) The category Y(P) is the category of the dependent in any counterpart construction.

In practice, we expect FF to be restricted in its application within a given language to a small set of constructions. In English, for example, FF appears to be largely restricted to the internal structure of NPs, with XP being either NP itself or Nom (the fused relative construction can, however, also involve other categories, see section 1.1 below). The subtypes of dependent involved are determiner, modifier and, in fused relative clauses, subject or prenucleus. However, we envisage the likelihood that FF constructions might involve further categories and further subtypes of dependent in other languages.⁶

[5] Note that an alternative analysis without FF, corresponding to the counterpart construction but with X represented by a zero category, would not automatically have this consequence. In principle, unless an ad hoc condition is imposed, the possibility of a further dependent intervening between the zero head X and Y(P) could not be excluded. Examples of the force of this adjacency requirement are given in the text with respect to individual constructions. Similar considerations apply *a fortiori* to any kind of process-based account in which Y(P) might be moved to the zero head: an adjacency restriction would have to be placed on this movement. We regard this as a conceptual advantage of the FF approach.

[6] Obvious candidates are forms such as French *au* or Italian *al* 'to the' which fuse the function of head of PP with that of the determiner of the following NP complement. A similar case is the fusion of head of PP with a relative or interrogative pronoun head in forms such as German *womit* 'with which/what'. A full analysis of these forms is beyond

1.1 *Fused relatives*

The most obvious example of an FF construction in English is found, we claim, in what we call the fused relative construction (in other frameworks this is commonly known as the ‘free’, ‘headless’ or, where the category involved is NP, ‘nominal’ relative construction). A standard NP example is given in (4):⁷

- (4) I’ll only eat whatever meals you can get without additives. (NP)

Here the underlined expression in (4) is an NP in which we propose that the relativized NP *whatever meals* functions as prenucleus of the relative clause modifier, but also simultaneously as head of the larger NP.⁸

In the case of the NP fused relative construction in (4) there is a counterpart non-fused construction as in (5):

- (5) I’ll only eat meals which you can get without additives.

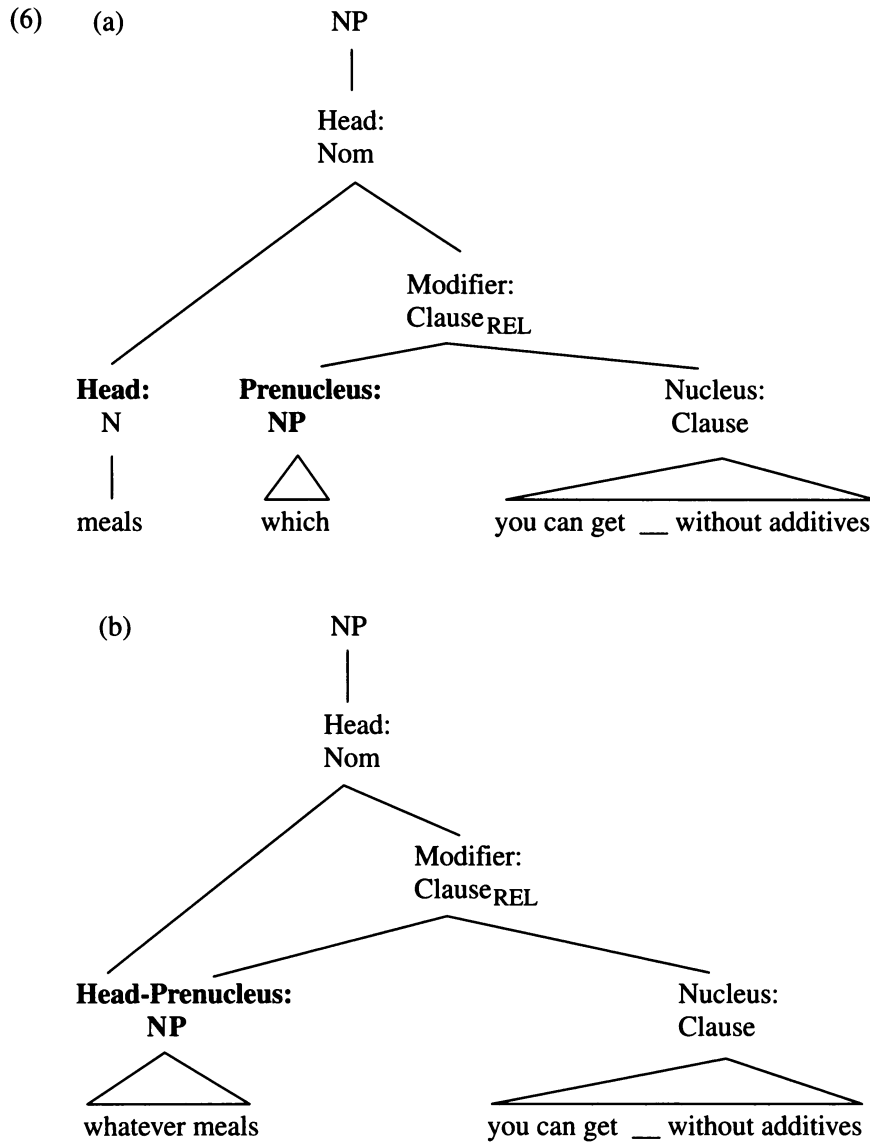
Diagrammatically, *CGEL* represents the non-fused relative in *meals which you can get without additives* as in (6a), and the fused relative *whatever meals you can get without additives* as in (6b):

the scope of this paper, but we note that although the constructions in which they occur are PPs the general condition that the category of the fused constituent be that of the dependent in the counterpart construction entails that we should treat *au/al* and *womit* as specialized types of article and pronoun respectively (and not as prepositions).

[7] See *CGEL* (1068–1070) for arguments against taking the superordinate node in fused relatives to be clausal, as in traditional grammar, or as sometimes proposed in formal grammatical frameworks, for example by Kuroda (1968) and Rooryck (1994). One argument which is particularly relevant (see also fn. 13) is the distributional argument that fused relatives occur as indirect object in the double object construction, as *I’ll give whoever asks me a ride to work*. The indirect object function is one which is otherwise realized almost exclusively by NPs (*I’ll give the bonnet a bit of attention*), or the specialized types of PP which have NP-like distributions (*I’ll give under the bonnet a bit of attention*, *They gave in the region of 50% of students distinctions*). A marginal exception is the occurrence of gerund-participials as indirect object, though these are likely to be considered somewhat awkward, and their distribution is limited to environments such as *give X some thought* (see *CGEL*: 1255).

[8] The NP *whatever meals* is the immediate head of Nom, which itself is the immediate head of the whole NP (see diagram (6b)). Since *whatever meals* is phrasal, it cannot itself function as the ultimate head of the whole NP. The ultimate head of the whole NP will rather be the ultimate head of *whatever meals*, that is, in the *CGEL* framework, the noun *meals*. Note that the standard sense of head is being used here, despite the departure (licensed by FF) from the canonical rules of projection within NP, which would normally permit an NP to function only as head of another NP (not a Nom). There should be no confusion with the notion ‘head of a relative clause’ (HORC), which is sometimes taken to encompass the material in the NP which is the antecedent for the gap in the relative clause, for example the underlined expression in an example such as *the ready-cooked meals which you can get without additives*. The HORC in our terms belongs to the category Nom; the relative phrase in an NP fused relative is of category NP.

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In the non-fused relative in (6a) the NP is headed by a Nom constituent which itself contains the ultimate head noun *meals* and the modifying relative clause. This relative clause in turn consists of the prenucleus (the relativized NP consisting of the relative pronoun *which*), and the nucleus (a clause containing a gap in object position). The parallel with the fused relative in (6b) is clear and systematic: in the fused relative the pre-nucleus function fuses with the head function, and this fused combination of functions is realized by a single constituent (the NP *whatever meals*).

The analysis in (6b) illustrates all of the distinctive properties we attribute to FF constructions:

- (i) In FF, a single lexical or phrasal category Y(P) simultaneously realizes two functions. A single category, in this case the phrasal category NP, simultaneously realizes two functions: head of Nom (therefore head, but in this case not ultimate head, of the whole NP) and prenucleus in the relative clause.
- (ii) FF is permitted in a category XP only between the head of XP and either an immediate dependent of XP or an immediate dependent of the immediate dependent of XP. The prenucleus–nucleus relation is a special case of the dependent–head relation, and so we have here fusion between the head of Nom and an immediate dependent (the prenucleus) within an immediate dependent (the relative clause modifier of the head). This is then the complex case of FF schematically shown in (3a).
- (iii) The fused functions are adjacent. The prenucleus in the fused relative construction must be adjacent to the head to which it is fused. Predictably, no modifiers can then intervene between the head and the relative clause. Note that this is not an immediate consequence of analyses in which the head is empty and the relative phrase realizes (in our terms) solely the prenucleus function.
- (iv) The category Y(P) is typically not identical to XP. The category NP of *whatever meals* is not identical to the mother category Nom, although of course NP and Nom are both legitimate projections of N. Fused relatives in English have the matching requirement that YP and XP are indeed both legitimate projections of the same lexical category. However, this is not a universal property of fused relatives, and not something which is required by the definition of FF.⁹

Furthermore, if we compare the fused relative in (6b) with the counterpart standard relative in (6a), there is conformity to the correspondence rules between FF and counterpart constructions:

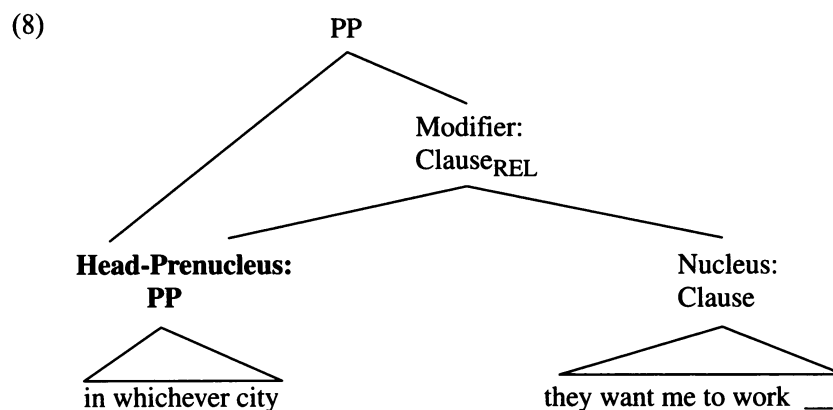
- (v) The category XP is a projection of the category of the ultimate head in any counterpart construction. The category XP is Nom, a projection of the category noun which functions as the ultimate head of the standard relative construction.
- (vi) The category Y(P) is the category of the dependent in any counterpart construction. Taking *which* as a relative pronoun heading an NP, the category of the fused constituent (NP) is that of the dependent (the prenucleus) in the standard relative construction.

[9] FF can therefore straightforwardly encompass fused relatives such as those cited by Grosu (1994, 2003) where the overall category is NP but the fused head-prenucleus is a PP. An example is Romanian [_{NP} [_{PP} *cu cine*] *vorbește Maria*] *e înșurat cu sora mea* (with who speaks Maria is married with sister my) ‘The person with whom Maria is speaking is married to my sister’. Here the fused relative is an NP functioning as subject, but the fused head-prenucleus is the PP *cu cine*.

The FF analysis of fused relatives extends naturally to cases in which the fused constituent belongs to a category other than NP:

- (7) (a) I'll work in whichever city they want me to work. (PP)
 (b) I'll be however responsive they want me to be. (AdjP)
 (c) I'll behave however correctly they want me to behave. (AdvP)

Following the category-matching constraint of fused relatives in English, the category of the underlined expression in (7a) will be a PP in which the PP *in whichever city* functions both as prenucleus of the relative clause and as head of the larger PP. Analogously, the underlined expression in (7b) will be an AdjP containing an AdjP (*however responsive*) as fused head-prenucleus, and the underlined expression in (7c) will be an AdvP containing an AdvP (*however correctly*) as fused head-prenucleus. The diagrammatic representation of the PP fused relative in (7a) will be (8):



The properties of PP, AP and AdvP fused relatives are clearly similar to those of NP fused relatives, though it should be noted that no counterpart construction exists in this case: standard relative clauses are modifiers only within Nom.¹⁰

An immediate advantage of the FF analysis follows from the automatic adjacency of the fused functions. Under an alternative approach in which the head and prenucleus are separate functions (or in other frameworks structural positions), there is no obvious reason why it should not be possible

[10] We thus follow Grosu (1996, 2003) and most modern work, contra Larson (1987), in assuming that fronted expressions such as *in whichever city* in (8) form a PP and that in English, at least, the category of the fronted expression and the category of the fused relative coincide.

to insert any other post-head dependent between the head and the prenucleus:

- (9) (a) [Head people] [ClauseREL who [you despise __]]
 (b) [Head Ø] [ClauseREL whoever you despise __]
 (c) [Head people] [Mod present] [ClauseREL who [you despise __]]
 (d) *[Head Ø] [Mod present] [ClauseREL whoever you despise __]

Consider then a potential non-fused structure such as (9b) in which the head is null and the relative phrase is solely the prenucleus of the relative clause.¹¹ Some additional stipulation would seem to be required to prevent the modifier *present* from intervening between this null head and the relative clause, as in the ungrammatical (9d).

A second useful property of the FF analysis is that it provides a natural account of the formal differences between ordinary and fused relatives. As is well-known, the series of *wh*-words which can be used in fused relatives differs considerably from those used in ordinary relatives; in particular, the non-personal form is *what* rather than *which*, and the personal form *who* is highly restricted in its use. What is more, the fused relative construction permits forms in *-ever* whereas ordinary relatives do not. For a full account of such differences see *GGEL*, pp. 1074f. These differences follow immediately from the notion that formal realizations of the same basic category can vary depending on the function it performs. The NPs which realize the fused head-prenucleus (or head-subject) function can differ formally from those which realize just the prenucleus (or subject) function. It is, however, not immediately clear why these formal differences should exist in an analysis which treats fused relatives as ordinary relatives modifying a null head.

The most striking advantage of the FF analysis, however, is that it straightforwardly accounts for the observation that optimal examples with the case-marked relative pronouns *who* or *whoever* are those in which the case of the pronoun (nominative or accusative) is proper to both the function of the fused relative itself and the function of the relativized NP. This is a special case of the potential for formal distinctions between categories realizing fused and non-fused functions. Consider the following examples (see *CGEL*: 1074):

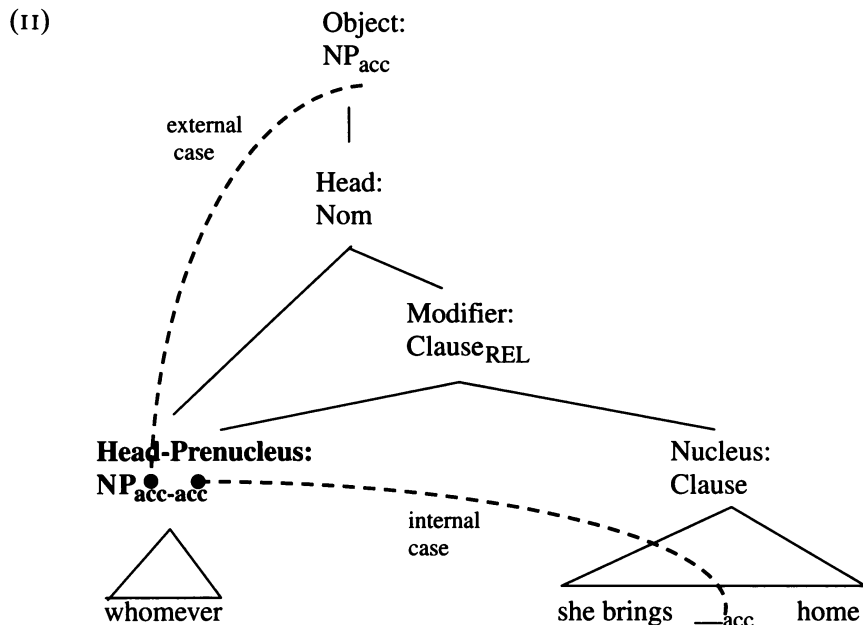
- (10) (a) [**Whoever** is responsible for the damage] must pay for it.
 (b) He will criticize [**whomever** she brings home].
 (c) ?[**Whomever** he marries] will have to be very tolerant.
 (d) ?She lunches with [**whomever** is going her way].

In (10a), the fused relative and the relativized NP are both subjects, and the nominative case of *whoever* satisfies the requirements of both functions.

[11] This then corresponds to the widely assumed analysis, originally proposed by Groos & van Riemsdijk (1981), in which the head is null and the relative phrase sits in Spec CP.

Similarly in (10b) the fused relative and the relativized NP are both objects and the accusative form *whomever* is fully acceptable in those varieties of English which permit accusative case in object relatives.¹² Where there is a conflict of function, however, as in (10c) and (10d), the accusative form *whomever* is marginal.

Quite simply, an NP like *whomever* in (10b) will be assigned two cases by pre-existing mechanisms in the grammar. One case (let us call this the 'internal' case because it originates properly from within the relative clause) is assigned by virtue of the object function of the relative clause gap. This case will be inherited by the prenucleus using exactly the same mechanism as is required for the case of the prenucleus in a standard relative clause. The second case (let us call this the 'external case') is derived by standard mother-head percolation mechanisms from the top NP, and reflects the object function of this NP. We will represent this double case assignment by a hyphen, viz. 'external case-internal case'. In (10b), then, the cases assigned are *acc-acc*, as illustrated in (11):



The realization of 'external case - internal case' is then straightforwardly a matter for morphological resolution rules. In English, we essentially have a matching requirement: *nom-nom* is realized as nominative case, and *acc-acc* as accusative case. When the rules which assign the cases conflict, we have

[12] There is considerable variation here, of course, with many speakers preferring the nominative form *who(ever)* in object function. See *CGEL* (464–467) for a full discussion. For such speakers, the form *whoever* will represent a satisfactory resolution of the case requirements in (9c) and (9d).

an instance of what we might call a 'syntactic quandary'. For *nom-acc* or *acc-nom* there is no fully acceptable resolution. However, many languages do allow case conflicts to be resolved (for an overview see in particular Vogel 2001, 2002). One strategy is that resolution is always possible and always in favour of the external case, as in Icelandic. Another is that resolution is always possible but depends on a hierarchy of obliqueness: *nom* < *acc* < *obl*.¹³ In Gothic, for example, resolution is always in favour of the more oblique case, whether this be external or internal. It is also possible, as in German, that resolution is sometimes possible and sometimes not, more oblique cases being generally harder to suppress. What is most important is that in principle either the external case or the internal case can 'win out'. There is therefore no reason on grounds of inflectional form to assume that either the head function or the prenucleus function must predominate in these constructions.

We regard it as a striking advantage of the FF approach to these constructions that no special mechanisms are required beyond morphological resolution rules to account for the matching effect in languages like English and for case conflict resolution in those languages where this is a possibility. Analyses without FF have to assume either that the relativized phrase functions as the head of the whole NP and there is no fronted element in the relative clause (this is the analysis of Bresnan & Grimshaw 1978, now largely rejected), or that the head of the whole NP is null and the relativized phrase occupies, in our terms, prenucleus position at the front of the relative clause (Groos & van Riemsdijk 1981 and most subsequent work). One of the main motivations of the original Bresnan & Grimshaw approach was the matching effect, since the relativized phrase as head would automatically bear the case of the whole NP. However, it is not clear how this analysis could plausibly handle case resolution where the relativized phrase bears the internal case.¹⁴ On the other hand, the Groos and von Riemsdijk approach

[13] The notion of a case hierarchy for case resolution in fused relatives originates with Harbert (1983).

[14] The inability of the Bresnan & Grimshaw approach to handle case resolution was not, however, the motivation for its rejection. The main argument was rather that it made the wrong predictions with respect to extraposition in languages such as German. Extraposition of fused relatives is possible in German, and (it was claimed) extraposition of noun phrases is not. The Groos & van Riemsdijk analysis on the other hand allows the clausal part of the fused relative to be extraposed, leaving the empty head in situ. The facts on which this argument is based remain somewhat unclear, however. Noun phrases are not universally excluded from post-verbal positions in German, as shown by Hirschbühler & Rivero (1983). The issue rests on whether the status, including the prosodic status, of extraposed noun phrases is equivalent to that of extraposed fused relatives and extraposed clauses. For recent argumentation (on the Groos & van Riemsdijk side) see Grosu (2003). Whatever the ultimate outcome of this debate, we note that the Groos & van Riemsdijk analysis makes entirely the wrong prediction about the behaviour of fused relatives with indirect object function in English. These, like all indirect object NPs, cannot undergo heavy NP shift. Compare *I'll give whoever asks me a ride to work* with **I'll give a ride to work whoever asks me*. On the Groos & van Riemsdijk analysis, we would expect the clausal section of the fused relative to permit extraposition, with the empty head remaining in

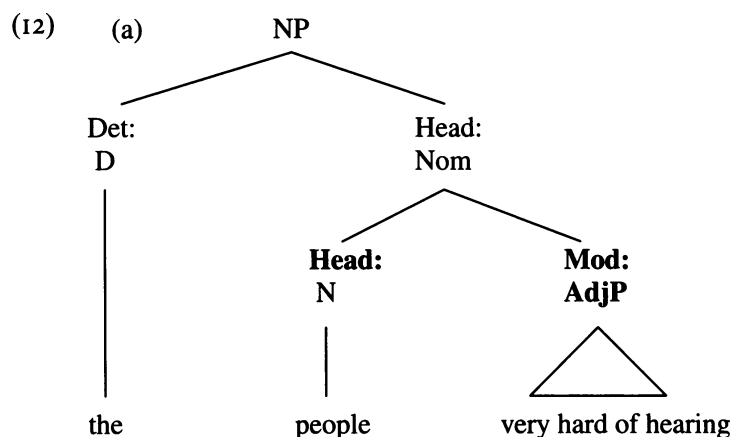
requires the postulation of an ad hoc ‘Comp Accessibility Parameter’, which allows the matrix case to percolate from the top NP to the prenucleus position inside the relative clause.¹⁵

The FF analysis of fused relative constructions thus has the significant advantage of not requiring additional ad hoc stipulations to account for either the adjacency of the head and relative clause, or the observed formal differences between fused and ordinary relatives. In particular, it provides a straightforward account of case matching and case resolution phenomena. For other properties of the analysis see *CGEL* (1068–1079).

1.2 Fusion of determiner or modifier within NP

The concept of fusion is also invoked to handle examples like *two of the apples*, where *two* is fused determiner-head, and *the biggest of the apples* or *the very hard of hearing*, where *biggest* and *very hard of hearing* are fused modifier-head and head-modifier respectively (*CGEL*: 410–422).¹⁶

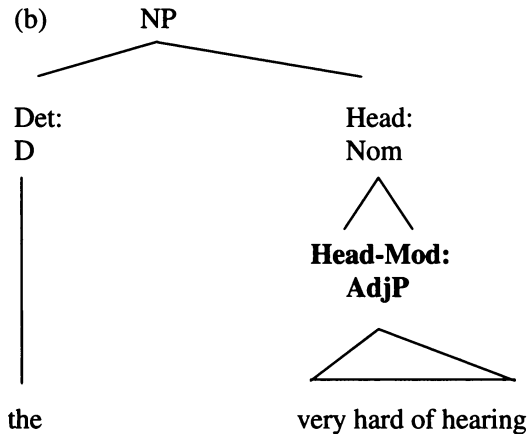
Compare the proposed analysis of *the very hard of hearing* (12b) and the analysis of non-fused *the people very hard of hearing* (12a):



situ. Compare *I'll give anybody a ride to work [who asks me]*, with extraposition from within an indirect object of a standard relative clause. The FF analysis makes the right prediction here, namely that fused relatives have the distribution of noun phrases.

[15] Avoiding the dilemma posed by the assumption that the relative phrase must be EITHER the head or the prenucleus is one of the main motivations for the analysis proposed by Rooryck (1994), in which fused relatives are clauses (CPs) and not noun phrases. In such an analysis, any case feature of the CP will pass to its specifier via head-specifier agreement. However, such an analysis violates both the reasonable assumption that clauses in English do not bear case, and the overwhelming distributional arguments that fused relatives are noun phrases. See fn. 6.

[16] Examples such as *I will do business with whichever of them comes up with the cash* involve multiple instances of fused functions. First of all, the NP *whichever of them* functions as fused head-subject in the fused relative construction. Secondly, in the internal structure of this NP the determinative *whichever* has fused determiner-head function.



In (12a), the adjective phrase *very hard of hearing* is a post-head modifier of the head noun *people*. In (12b) the adjective phrase modifier is fused with the head. The adjectival status of the fused constituent is clearly demonstrated by the presence of the adverb modifier *very*. Note that in this case the fused and non-fused constructions are not semantically equivalent. Examples like *the people very hard of hearing* cannot be interpreted generically. This is an a priori argument for thinking that the fused construction is not related to its counterpart by simple omission of the head.

This FF construction conforms to the principles we propose:

- (i) In FF, a single lexical or phrasal category Y(P) simultaneously realizes two functions. A single category, in this case the phrasal category AdjP, simultaneously realizes two functions: head of Nom (therefore head, but not ultimate head, of the whole NP) and modifier of that head.
- (ii) FF is permitted in a category XP only between the head of XP and either an immediate dependent of XP or an immediate dependent of the immediate dependent of XP. The modifier relation is a special case of the dependent–head relation, and we have here fusion between the head of Nom and an immediate dependent of Nom. This is the simple case of FF schematically shown in (2a).
- (iii) The fused functions are adjacent. The modifier must be adjacent to the head to which it is fused. Predictably, then, no further modifiers can intervene between the head and the fused modifier. Note that this is not an immediate consequence of analyses in which the head is null and the adjective phrase realizes (in our terms) solely the modifier function.¹⁷

[17] Note that in an analysis in which the presence of an AdjP like *very hard of hearing* can license a preceding null head (as in *the Ø very hard of hearing*), it is not immediately obvious why another post-head modifier cannot intervene: **the Ø in the room very hard of hearing*

- (iv) The category Y(P) is typically not identical to XP.
The category AdjP of *very hard of hearing* is not identical to the mother category Nom.

Furthermore, if we compare the fused construction in (12b) with its counterpart construction in (12a), there is conformity to the correspondence rules between FF and counterpart constructions:

- (v) The category XP is a projection of the category of the ultimate head in any counterpart construction.
The category XP is Nom, a projection of the category noun which functions as the ultimate head of the non-fused construction.
- (vi) The category Y(P) is the category of the dependent in any counterpart construction.
The category of the fused constituent (AdjP) is that of the modifier in the non-fused construction headed by *people*.

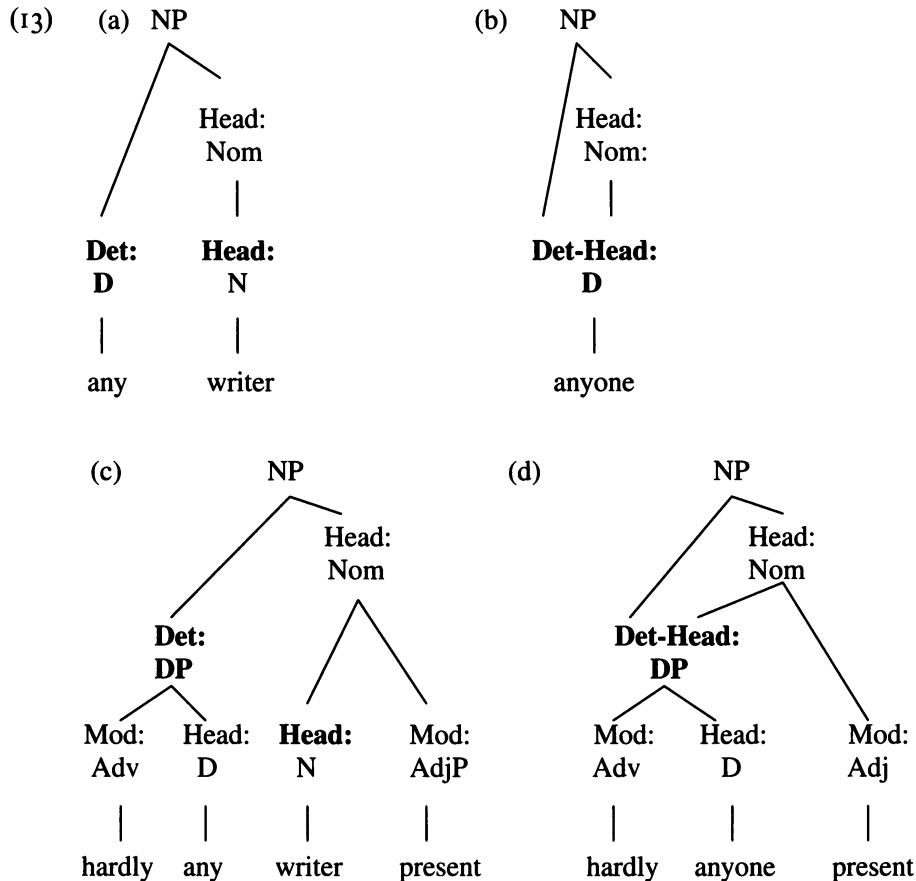
A detailed rationale for the FF analysis of such examples is given in *CGEL* (410–422), and we will not repeat it here. However, it can be noted that the potentiality for formal differences between categories realizing fused and non-fused functions is observed here just as it is in the fused relative construction. For example, the determinative *every* cannot occur as fused determiner-head (**every of the students*), and the determinative *no* has a specialized morphological variant *none* which is restricted to the fused function. The transparent relation between form and function in our approach, together with the independently motivated lexical distinction between determinatives that allow FF and those that do not, provides for a very natural description of such facts.

1.3 Compound determinatives

The special case of fusion most relevant to the analysis of *once* is that illustrated by *somebody*, *everything*, *anyone*, etc.: these are compound determinatives functioning as fused determiner-head (*CGEL*: 423f.). The primary motivation for analysing these compounds in this way (rather than as pronouns, as in traditional grammar) is that they take exactly the same pre-head modifiers as the determinative bases they contain: compare *not everything* and *not every house*, *hardly anyone present* and *hardly any writer present*, and so on. By contrast, the post-head modifiers are those, like the adjective *present*, which are appropriate as dependents within NP.

(contrast *the people in the room very hard of hearing*). An adjacency requirement has to be imposed, but this adjacency requirement is a corollary of the FF approach.

The *CGEL* representations of *any writer*, *anyone*, *hardly any writer present* and *hardly anyone present* are given in (13):¹⁸



In (13a) we have an NP consisting of the determinative *any* functioning as determiner and the head noun *writer*. In (13b) we see the parallel analysis of the compound determinative *anyone*: here the functions of determiner and head are fused and the exponent of the fused functions is the compound determinative *anyone*. Example (13c) shows the determinative *any* pre-modified by the adverb *hardly*; together these form a DP (Determinative Phrase) which functions as determiner (see footnote 2). The most complex example is (13d), in which *anyone* functions as the head of the DP, allowing modification by *hardly*, but also simultaneously as the head of the whole NP

[18] Note that, in order to clarify the correspondences between simple and more complex constructions with FF, we do not follow here the *CGEL* convention of simplifying diagrams by not showing nodes of category Nom when they would be unbranching in the sense of dominating a single function (compare examples (13a, b) and (13c, d)).

in which there is an adjectival modifier. This adjectival modifier fulfils a specialized modifier function, termed the ‘restrictor’ function; this function is non-recursive and can only be realized by constituents in post-head position, but in addition to normally permitted post-head adjectives and adjective phrases, it also allows simple adjectives which would normally occur pre-nominally. It is a particular strength of the FF analysis, we argue, that it provides an explanation for the janus-like behaviour of forms such as *anyone* which have adverbs as premodifiers but adjectives and adjective phrases as postmodifiers. Also, the assignment of determinative category status to these forms follows from the nature of the pre-head and post-head modifiers. The pre-head Adv is an appropriate modifier within the DP which fulfils the fused Det-Head function, and this DP must have a D as head.

Null-headed analogues of the *CGEL* analysis have subsequently appeared, in particular Larson & Marušič (2004) and following them Leu (2004), and these can be directly compared.¹⁹ Larson & Marušič (2004) provide an interesting and novel set of arguments that adjectival modifiers which follow (in our terms) compound determinatives pattern with post-nominal adjectival modifiers generally, and not with pre-nominal ones, in the sense that specifically pre-nominal forms or pre-nominal interpretations of general adjectival forms are excluded.²⁰ For example, Sadler & Arnold (1994) note that measure adjectives in pre-nominal position are inflectionless and more word-like (*a 23-inch-long rope*) while in post-nominal position the modifier is more phrase-like and the measure itself is marked plural (*a rope 23 inches long*). With compound determinatives, the post-nominal position and

[19] Leu’s (2004) analysis is in essence a more complex version of the configuration in (14) in which the bases in forms like *something* occupy two distinct functional heads higher than the null head. This analysis will require the same stipulation to block the occurrence of pre-head AdjPs. Leu does, however, provide an interesting comparison of the properties of these constructions in English, French and Swiss German. The Swiss German data nicely show that the equivalent compound determinatives have the inflectional properties of determinatives rather than nouns. However, using the French construction *quelque chose de beau* (something of nice) ‘something nice’ as a model, Leu also proposes that restrictors in English contain a null preposition. There would appear, however, to be no real justification within English for such an analysis. In particular, while it is true that the *de* phrase in French can be stranded in analogous extraction constructions (*qu’est-ce que tu as vu de drôle?* (what is-it that you have seen of funny) ‘What did you see which was funny?’), there is no such extraction possibility in English. The presence of the preposition *de* in French merely shows, we believe, that the restrictor function is indeed a specialized function which should not be directly equated with the post-head modifier function in standard NPs, and that it may have distinctive overt realization.

[20] The focus of Larson & Marušič (2004) is to argue against the earlier movement-based analyses of Abney (1987) and Kishimoto (2000) in which the nominal base in compound determinatives moves, over any intervening pre-nominal adjectives, from head N position to adjoin either to D itself (Abney) or to the functional head Num (Kishimoto). These analyses cannot account for the exclusion of specifically pre-nominal adjectival forms from the compound determinative construction.

form are required (*anything 23 inches long*/**23-inch-long anything*/**anything 23-inch-long*). Observations such as these are of course consistent with CGEL's claims that the modifier in the compound determinative construction is essentially post-head, and that certain adjectives are restricted to pre-head positions.

Larson & Marušič (2004) very briefly sketch two null-headed analyses, one of which is a direct null-headed analogue of the analysis in CGEL.²¹ In it, forms such as *anyone* are morphologically complex Ds in the following configuration:

- (14) [_{DP} D (*AdjP) [_{NP} Ø] AdjP]

As Larson & Marušič themselves point out, a significant problem with this account is that it requires a stipulation that pre-head AdjPs are not permitted when the head is null. This is of course precisely the kind of stipulation which is not required when the determiner and head functions are fused. The impossibility of an intervening pre-head AP follows automatically from the adjacency requirement in the FF construction, and this itself ultimately follows from the more fundamental constraint against crossing branches.

2. *ONCE*

We distinguish five uses of *once*. The examples in (15) illustrate.²²

- (15) (a) I will only say this to you once. [numerical]
 (b) Not once have I seen anything like this. [singulative]
 (c) They were once respected members of the community. [past]
 (d) We were welcomed by the once mayor of New York. [term of office]
 (e) I will leave once you are all ready. [sequential]

[21] The second analysis involves generating all AdjPs in post-head position and then moving some adjectives to pre-head position in normal NPs. This proposal is clearly less parsimonious than any analysis without movement, including that in (14), and leaves open many questions, not the least of which is how the generally recursive pre-nominal structures are to be derived. Larson & Marušič themselves come to no conclusion about which analysis is to be preferred.

[22] The examples of *once* and *twice* used in this paper are for the most part direct attestations from web-based sources and were found using the Google search engine via the software front end KwicOnGugle written by Professor Hiroaki Sato of Senshu University, to whom we are indebted for assistance. The URLs of these examples are listed, together with occasional printed sources, in an Appendix. We do, however, use simplified examples where authenticity is not an issue, as in (15).

Numerical *once* indicates 'one occasion', and is directly equivalent to the analytic expression *one time* with an overt occurrence of the determinative *one*.²³ Just as the numerical use of determinative *one* invites a contrast with other cardinal numerals, so numerical *once* contrasts with *twice* and archaic *thrice*, indicating 'two occasions' and 'three occasions' respectively.²⁴

The uses of *once* in (15b) and (15c) both correspond to what are called 'singulative' uses of the determinative *one* (CGEL: 386f.), where the contrast with higher cardinals is backgrounded. In (15b) we have the case where *once* is modified by *not*; this *not* can similarly modify *one*, but is for the most part not compatible with the higher cardinals. Equivalently, we do not have here a contrast between *once* and *twice*. Past *once* can be thought of as a specialized singulative use with the meaning 'at some time in the past', where the 'one' component is similar in meaning to *some* and again has no numerical import. An obvious parallel is with the analytic expression *one day*, which employs a similar singulative use of *one* but has the special meaning 'at some time in the past/future'.²⁵

The term-of-office use of *once* in (15d) appears related to the past use, but in fact is restricted in its application to terms of office, with a meaning something like 'for one (past) term'. Typical uses are therefore as attributes to names of offices (*mayor*, *president*, *prime minister*, *governor*, etc.). We could not naturally say **my once job as a glass-blower*, where the adjectives *former* or *onetime* seem more appropriate. This term-of-office use is for many speakers singulative, so that the numerical import is absent and *once* indeed has a meaning very close to *onetime*. However, there are also many speakers who allow the use of higher forms like *twice* in a similar function with the meaning 'for two (past) terms'.

Finally, sequential *once* in (15e) relates two events sequentially in time, and is similar in meaning to *after*. Any relationship with the determinative *one* in this case seems absent.

[23] We do not wish to imply, however, that the expressions *once* and *one time*, or *twice* and *two times*, have identical external syntactic distributions. Compare, for example, *They twice refused to answer* and **They two times refused to answer*.

[24] Numerical *once* also occurs frequently as a base in compounds such as *once-daily*, *once-widowed*, etc., and in expressions of degrees of genetic relatedness as in *a cousin once removed*. It contrasts with *twice* (*twice-daily*, *twice-widowed*) and such compounds account for the only productive occurrences in modern English of *thrice* (*thrice-daily*, *thrice-widowed*).

[25] Like *one day*, *once* has a (now obsolete) use denoting future time. Compare W. Congreve 1700 (cited by the *Oxford English Dictionary*): *To refuse the sweets of life because they once must leave us ... is as preposterous, as to wish to have been born Old, because we one Day must be Old*.

2.1 *Numerical once*

From a syntactic point of view, numerical *once* has a host of distributional characteristics which are inconsistent with an adverb analysis. They are illustrated in (16):²⁶

- (16) (a) I admit that I did try jogging once, but only the once.
 (b) I am determined to choose, just this last once, my own destiny.
 (c) It only happens every once in a blue moon.
 (d) Every once in a while we come up with an offer that is too good to miss.
 (e) Pam took him [a guidedog] over to the vet when we got back to campus; the recommendation was to try split feeding, that is, twice a day instead of the once that we're doing now.
 (f) If you study the pulleys you will see that the little one is going round four times for every once that the large pulley goes round.
 (g) Once is enough.
 (h) I can foresee at least once when I won't have to do it.

Example (16a) illustrates a common use of numerical *once* in which it is preceded by the definite article. Typically this use also involves a preceding peripheral focussing adverb such as *only*, *just* or *even*. Example (16b) illustrates that instead of the definite article we can have a demonstrative, and also the adjectival modifier *last*. The expression *once in a blue moon* in (16c) is an idiom meaning 'very rarely', but clearly includes an instance of numerical *once* as shown by frequently attested examples of the derivative expression *twice in a blue moon*, as in (17):

- (17) Please EMAIL ME and indicate any of the current software they [use/have used/may use] [regularly[sic]/sometimes/once or twice in a blue moon].

Most significantly, however, example (16c) shows that numerical *once* can be determined by the determinative *every*. The idiom *once in a while*, 'sometimes, but not often', in (16d) is similar in allowing *every* as a determiner.²⁷ Here too we seem, on the basis of meaning, to have an occurrence of numerical *once*; the derivative *twice in a while* is again attested, though less frequently than *twice in a blue moon*. In (16e) and (16f) *once* is modified by

[26] For one anonymous *JL* referee expressions like *this last once* (in (16b) here) are ungrammatical. There may be some speaker variation here, but we do not know its extent or distribution.

[27] For some speakers, the expression *once and again* can also be used in a similar sense. Like *once in a while*, it permits *every* as a determiner. An attested example is: *Still inspired by literally everything that surrounds them, they have retained their cheeky freedom to (every once and again) dabble in a little cultivated nonsense*.

a post-head relative clause, with *the* or *every* again as determiner;²⁸ the numerical meaning is evident from the overt contrast with *twice* and *four times*. And finally, numerical *once* can, in an admittedly limited way, function in major argument positions, as in (16g), where it is subject, or (16h), where it is object.

A fair number of dictionaries and grammars note some of these constructions and analyse *once* as a noun when it appears in these contexts. There are, however, two objections to this way of handling the data.

In the first place, it is an unnecessary complication to assign *once* to different categories in such examples as (18a), ‘adverb’, and (18b), ‘noun’:

- (18) (a) I only met her once.
 (b) I only met her that once.

At the phrasal level, *that once* in (18b) is uncontroversially an NP, and there is no reason to exclude an NP analysis of *once* in (18a). To be sure, the function of *once* in (18a) is that of adjunct, but there is no general exclusion of NPs from adjunct function; a limited range of NPs can appear as adjuncts of various types, as in *She arrived last week*, *Do it this way*, *I found it just the other side of the path*, and so on. In the specific case of a frequency adjunct we have *that once* but also *four times* and other expressions headed by *times*. There is a tacit but quite unjustified assumption in traditional grammar that nouns can appear in adjunct function only when accompanied by an explicit dependent. Thus while *Tuesday* is a noun in *I met her last Tuesday*, where it has *last* as dependent, the *yesterday* of *I met her yesterday* is analysed as an adverb – though both are taken as nouns in *We spent last Tuesday/yesterday in Rome*. But we don’t need a dual-category analysis of *yesterday*: it is a noun in both cases, the difference being simply a matter of function, adjunct vs. object (see *CGEL*: 564f.). We likewise don’t need a word-category distinction to handle the difference between the *once* of (18a) and that of (18b) – or (16g).

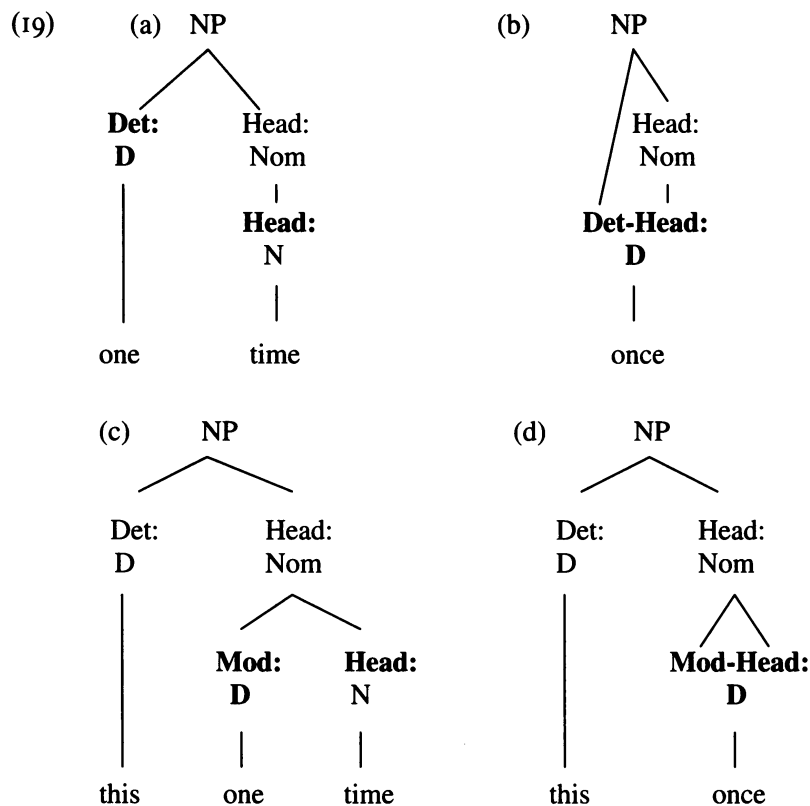
A second objection is that while the underlined expressions in (16) and (18) are NPs, it does not follow that *once* has to be analysed here as a noun. A more explanatory account of the data can be given if we include numerical *once* in the category of compound determinatives that appear in the fused-head construction. The compound determinatives given in *CGEL* – *somebody*, *someone*, *something*, *somewhere*, etc. – consist of a determinative base (*some*, *every*, *any* or *no*) and a nominal base (*body*, *one*, *thing* and *where/place*).²⁹ The morphological compounding in this case reflects the

[28] We note that *every* does occasionally occur as modifier in fixed phrases like *every so often* and *every now and then* (compare **every often* and **every now*). Examples like (16f) show, by contrast, that *every* occurs with *once* freely, and is not restricted to fixed phrases like *every once in a while* and *every once in a blue moon*.

[29] The raised decimal point notation denotes a morphological component of a larger word. In this paper we use it when morphological components are specifically discussed as separate formants.

fusion of two syntactic functions within NP structure, that of determiner and that of head. Numerical *once* and likewise *twice* and archaic *thrice* can similarly be thought of as compounds of a determinative base (numerical *on*, *twi*, *thri*) and a noun base *ce* (meaning 'time').³⁰

An immediate advantage of this conception is that we obtain an explanation for why numerical *once* can occur both with and without a determiner, a property which is not that of a normal singular count noun. While the determinatives *some*, *every*, *any* and *no* can function solely as determiners and therefore never permit a preceding determiner, the numerical *one* can function both as determiner, as in *one time*, *on'ce*, and as a modifier with a preceding determiner, as in examples like *this one time*, *this on'ce*. The structures we propose are thus as in (19):



[30] This would represent a reanalysis of the original genitive ending of *one* (modern English *once* < OE *anes*, *anes*). The compound determinative analysis therefore has relevance for the debate on whether degrammaticalization is a possible mechanism of historical change: the final sibilant in *once*, *twice* and *thrice*, historically an inflectional formant, has plausibly been reanalyzed as a lexical (derivational) formant. This issue is, however, tangential to the main concerns of this paper and we will not pursue it here.

Further properties of numerical *once* follow straightforwardly. Since *once* in (19b) represents a fusion of determiner and head, there is no possibility of an attributive adjective preceding the determiner: **last once* is excluded for the same reason as **last one time*. On the other hand, it is perfectly possible for the attributive adjective to follow the determiner in (19d) and (19c), giving *this last once* and *this last one time*. These properties as before follow automatically from the adjacency requirement on FF. Note in particular that a potential analysis without FF in which *once* is D and is followed by a null head will not, without stipulation, be able to block examples in which an adjective intervenes, for example **(this) once last Ø*.

As a determinative, numerical *once* permits the same pre-head modifiers as the determinative *one*:

- (20) (a) You should really see this film at least once.
 (b) You should really see this film at least one time.

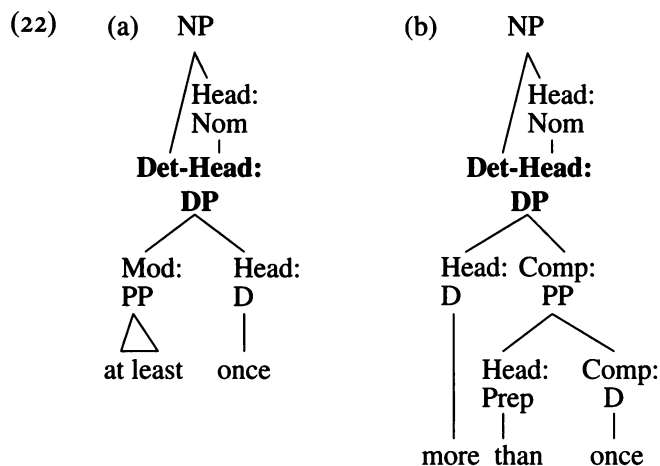
The analysis of (20a) is analogous to that of (13d): *once* is the head of a DP in which it is modified by *at least*, and this DP functions as the fused determiner-head of the whole NP.

Also, the determinative *one* can occur embedded within semantically numerical DPs such as *more than one* and PPs such as *up to one*. In these cases the numeral is not the head of the DP or PP (see *CGEL*: 432f.); the respective heads are the determinative *more* and the preposition *up*. Rather, *one* functions as the complement of the prepositions *than* or *to*. As can be seen in (21), the behaviour of *once* is again exactly parallel.

- (21) (a) I have been to Archangel more than once.
 (b) I have been to Archangel more than one time.

The analysis of (21a) has to be slightly more complex than that of (20a), but is essentially the same. The function of *once* is complement of *than* within a DP which functions as fused determiner-head of the whole NP. Representations of the underlined NPs in (20a) and (21a) are given in (22):³¹

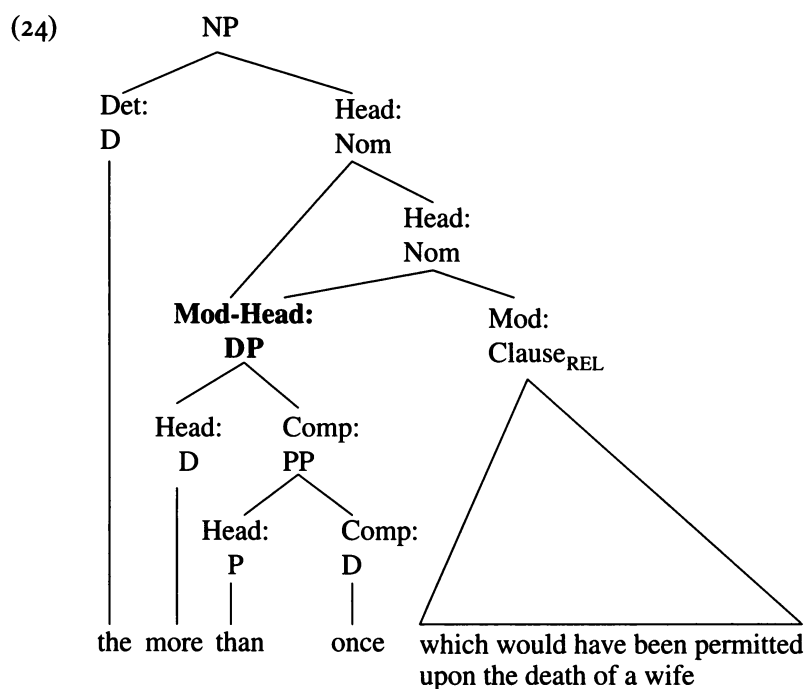
[31] It is worth noting that we take the whole DP *more than once* in (22b) to realize the fused determiner-head function in the NP, and here *once* is the complement rather than the head of that DP. The DP *more than one* in counterpart non-fused expressions such as [_{NP} [_{DP} *more than one*] [_N *time*]] is also taken to be headed by *more* (for the rationale and the agreement complications see *CGEL*: 432). The ability of a numeral in complement function to determine the distribution of the phrase in which it occurs can also be seen in cases with PP determiners such as [_{NP} [_{PP} *up to two*] [_N *times*]]. Correspondingly, in [_{NP} [_{PP} *up to twice*]] we would take the PP to realize the fused determiner-head function within the NP.



Predictably, DPs of this more complex type can also function, preceded by a determiner, as fused modifier-heads. An attested example is (23):

- (23) Similarly, 1 Timothy 3 insists that a bishop must have been married only one time, not the more than once which would have been permitted upon the death of a wife.

The analysis of (23) follows just as straightforwardly from the general framework, and is given in (24):



In (24), the DP *more than once* functions simultaneously as the modifier within the higher nominal, and the head of the nominal which contains the relative clause.

A final parallel between numerical *once* and in particular the existential compound determinatives (*something, anything*, etc.) is the ability to take *more* as a special post-head modifier, as in *once more, something more, anything more*.

2.2 Singulative once

The most productive use of singulative *once* is following the negator *not*, just like singulative *one*.³² However, we can also identify two further uses as belonging to this type: the *once* which occurs following conditional *if*, and the *once* which occurs in the fixed expressions *for once* and *once and for all*.³³ Examples with *not* and *if* are given in (25) and (26):

- (25) (a) Not once will you hear anything like this again.
 (a') *Not twice will you hear anything like this again.
 (b) Not one answer satisfied him.
 (b') *Not two answers satisfied him.
- (26) If you once allow the dog onto furniture or into the bedroom, it will be difficult to reverse such action if you subsequently decide that it was not a good decision.

The negator *not* is not generally found with higher cardinals, and this holds in (25a') just as it does in (25b'). The form *once* in (25a) therefore stands as the singulative counterpart of numerical *once*, just as singulative *one* stands in relation to numerical *one* (CGEL: 386). Likewise, the use of *once* following *if* in (26) parallels the use of *one* in the phrase *at one time or another*; this *one* is also singulative, as can be seen from the ungrammaticality of **at two times or another*. Just as there is no reason to think of singulative *one* and numerical *one* as belonging to distinct categories (they are both manifestations of determinative *one*), so it seems reasonable to consider singulative *once* as belonging to the same compound determinative category as numerical *once*.

[32] It should be noted that singulative *once* is not limited to past contexts. Past *once*, which is also singulative in nature, is therefore discussed as a separate, specialized use.

[33] The *once* which occurs in *for once* and *once and for all* clearly lacks any contrast with the higher cardinals. Both expressions, however, to some extent invoke the idea that a single occasion is involved and for this reason might be included as singulative uses: *for once* is approximately equivalent to 'on this one occasion', and *once and for all* to 'on this one final occasion'. The *once* that occurs in the expression *at once* when this means 'at one time/simultaneously' might also be added; however, the expression *at once* where the meaning is 'immediately' is totally opaque.

One apparent difficulty with this conclusion which must be addressed is the fact that singulative *once* nevertheless lacks many of the distributional characteristics of numerical *once*. In particular, singulative *once* is incompatible with determiners and attributive adjectives. However, it is also a characteristic of singulative *one* that it always functions as a determiner, not as a modifier, and this will naturally account for these distributional properties. A further determiner is inadmissible because NP structure does not permit more than one determiner, and an attributive adjective is impossible because here the determiner function is fused with the head function. It should be noted however that post-head relative clauses are indeed still possible, including ones with *when* and *while* as relative words:

- (27) (a) Not once that I can think of have I ever seen a mess like this!
 (b) Not once when I reported my uncle did I use the word 'rape'.
 (c) Not once while I have used this software has it caused a computer to crash.

2.3 *Past once*

Past *once* occurs typically as a clause-level adjunct, as in (28a), and can also be identified as the *once* which occurs in the phrase *once upon a time*. It can take post-head relative clauses with *when* and *while*, as in (28b) and (28c):

- (28) (a) I was once a teenage werewolf.
 (b) Once when the opera Aida was about to be performed a singer was missing.
 (c) Once while I was in Australia I went to see the penguins on Phillip Island.

In all environments, past *once* has the meaning 'at some time in the past'. The sense of 'one' that occurs in this use is the same as occurs in one sense of the expression *at one time*, when this is interpreted as 'at some time in the past', or in the expression *one day*, meaning 'at some time in the past/future'. Both of these involve singulative uses of *one*. Past *once* would seem therefore to be best considered as a further, somewhat specialized, use of the compound determinative with a singulative determinative component. The impossibility of further determiners and attributive adjectives follows for the same reasons as with singulative *one* in section 2.2.

2.4 *Term-of-office once*

Term-of-office *once* occurs solely as an attributive modifier referring to a term of office in the past. It does contrast with higher forms like *twice* in this sense, but such higher forms are rare, so that the salient interpretation is

singulative, somewhat akin to that of *onetime* or *former* in the same function. Two attested examples are given in (29):

- (29) (a) The once mayor of New York David Dinkins spoke of 'the gorgeous mosaic' that has presumably replaced the earlier image of the American melting pot.
 (b) We were lucky enough to have Grant (a local) bring his car out and run us around. He took us up to Monticello, once home of the once president.³⁴

The boundaries of this use of *once* are murky, but the overwhelming majority of attestations occur as attributes to names of offices such as *mayor*, *governor*, *senator*, *prime minister*, *president*, *captain*, etc.³⁵ Occasional uses are found with terms like *partner*, *wife*, and *husband*, e.g. ?*my once partner*, though these seem somewhat less natural. The contrast with past *once* can be seen in (30a) and (30b):

- (30) (a) *I am a once gardener at Kew.
 (b) I was once a gardener at Kew.

From a syntactic point of view, term-of-office *once* might simply be treated as an adjective. However, there would seem to be no compelling reason to proliferate the number of categories attributable to *once* in this way (especially as a similar move would have to be made for *twice* and *thrice* in the same function). Term-of-office *once* can again plausibly be identified as a specialized use of the compound determinative, though it should be noted that, as an attribute, it will act as a fused modifier-head forming a nominal rather than forming a full NP.

2.5 Sequential *once*

Unlike all the previous uses of *once*, sequential *once* does not transparently contain any sense of 'one' as part of its interpretation:

- (31) (a) Once you have finished, report to me!
 (b) At the time you have finished, report to me!

Once here conveys only that the event of reporting should directly follow the event of finishing; an analytic paraphrase involves the expression *at the time*, rather than *at one time*.³⁶ The closest parallel in this case is with temporal

[34] The first *once* in example (29b) is of course past *once*. The president in question is Thomas Jefferson.

[35] By extension, we occasionally find examples in which *once* as an attribute is applied to nouns like *residence*, where the place of residence of some official is denoted, e.g. *Concord is famous as the once residence of both Ralph Waldo Emerson and Henry David Thoreau*.

[36] An anonymous *JL* referee suggests 'at the one time that' as a potential paraphrase for sequential *once*. Clearly the uniqueness implied by 'one' can lead to the definiteness of the

after, as in *After you have finished, report to me!*: both take complements having the form of a declarative clause that excludes the subordinator *that*. We argue therefore that sequential *once* should be handled in the same way as this *after*.

Dictionaries and traditional grammars likewise assign this *once* to a different word-category than those covered in earlier sections. They analyse it – again like *after* in the use just illustrated – as a subordinating conjunction. We take the view, however, essentially following Jespersen (1924: 89) and numerous works in formal grammar such as Emonds (1976), that most of traditional grammar's subordinating conjunctions should be analysed as prepositions, thus allowing prepositions, like verbs, nouns and adjectives, to take a range of different categories of complement, including finite subordinate clauses (see *CGEL*: 1011–1014; Huddleston & Pullum 2005: 128–130). *After* will thus be a preposition not only in *after dinner* but also in *after you have finished*, and this is the category to which we assign sequential *once*.³⁷

3. *TWICE* (AND *THRICE*)

We distinguish three uses of *twice* and archaic *thrice*. Two of these correspond to uses of *once*: the numerical use in (32a) and the term-of-office use in (32b). Counterparts to the singulative, past and sequential uses of *once* are self-evidently lacking. However, we can also identify a further multiplier use for *twice* (and *thrice*) which is absent for *once*. This is illustrated in (32c):

- | | | |
|----------|---|------------------|
| (32) (a) | I am only going to say this to you <u>twice</u> . | [numerical] |
| (b) | We were welcomed by the <u>twice</u> mayor of New York. | [term of office] |
| (c) | They earn <u>twice</u> the amount we do. | [multiplier] |

3.1 Numerical *twice* (and *thrice*)

Numerical *twice* has exactly the same distributional characteristics that were described above to motivate the compound determinative analysis of numerical *once*. Attested examples include the occurrence with a determiner in (33a), an attributive adjective in (33b), a post-head relative clause in (33c),

time reference in sequential *once*, and we would predict this to be a major factor in the diachronic development of sequential *once*. However, in example (31b) the expression *at the one time that* would sound to us somewhat unnatural.

[37] In this analysis, the existence of a category of 'intransitive' prepositions is recognized, i.e. prepositions which do not take NP objects. For example, *while* is such a preposition: it takes a complement clause (*while I was eating dinner*) but not an NP object (**while dinner*). *Once* patterns more like *while* than *after*. Compare *after dinner*, **while dinner*, **once dinner*.

and pre-head modifiers such as *at least* in (33d), and the ability to function as subject in (33e):

- (33) (a) I want to confess: I drank Jeffrey Archer's champagne. In mitigation, it was just the twice, and many years ago, at the parties he used to throw in his hotel suite at Tory conferences. I never touched so much as a forkful of his shepherd's pie.
 (b) BBC2 is repeating the war walks series on a Tuesday so keep an eye out for the Bosworth episode, I've missed it the last twice.
 (c) I have given way generously and I do not propose to do so again, unless it is to the Minister, to whom I am prepared to give way more than the twice that I promised.
 (d) I stuck my finger into an outlet at least twice that I can remember.
 (e) Violations of privacy through history prove twice is enough.

The analysis of numerical *twice* therefore exactly parallels that of numerical *once*. When a determiner is absent it is a compound determinative functioning as a fused determiner-head within NP structure; when a determiner is present, it is a compound determinative functioning as a fused modifier-head within a nominal.

3.2 *Term-of-office twice (and thrice)*

Attested examples of *twice* or *thrice* as an attribute referring to the number of times a particular office has been held are not as common as simple examples of term-of-office *once*, and many speakers find them unnatural. However, this usage is illustrated for *twice* from a contemporary source in (34a), and in (34b) for *thrice* in a source dating to the mid-19th-century:

- (34) (a) Grover Cleveland was the twice president of the United States (1885–1889, 1893–1897), and spent his retirement years in Princeton.
 (b) Between this spot and Highgate Hill was the Whittington stone, now replaced by another, where the thrice Lord Mayor of London heard the sound of Bow bells.

As with term-of-office *once*, this use can be analysed as a compound determinative in fused modifier-head function, forming a nominal functioning as attributive modifier.

3.3 *Multiplier twice (and thrice)*

Multiplier *twice* is seen in examples such as those in (35):

- (35) (a) They won twice the amount we did.
 (b) They were travelling twice as fast as we were.
 (c) Twice three is six.

Evidently *twice* here corresponds to and can be replaced by the analytic expression *two times*, where *times* has a multiplicative rather than an ‘occasion’ sense. In (35a) *twice* is functioning as a predeterminer modifier in NP structure, preceding a definite determiner. In (35b) it is functioning in the structure of an AdvP, modifying a comparison of equality.³⁸ Example (35c) illustrates its use in multiplication tables. The absence of *once* in these constructions follows straightforwardly from the fact that *once* corresponds to ‘one time’ rather than ‘one times’. In the multiplication table example we would have *One times three is three* as opposed to **Once three is three*.³⁹

Some modern grammars and dictionaries analyse the *twice* of (35a) as a predeterminer – see, for example, Quirk, Greenbaum, Leech & Svartvik (1985: 257), Sinclair (1987: 1575), Proctor (1995: 1572), Biber, Johansson, Leech, Conrad & Finegan (1999: 258). In these works, however, ‘predeterminer’ is the name of a category (or subcategory within the determiner category), rather than of a function, as in our own usage. For these works *twice* belongs to a different category in (35a) than (35b), where it is taken to be an adverb, but this is an unnecessary complication. The difference is simply one of function: there is no more reason to make a category distinction with the single word *twice* than there is with the two-word expression *two times*, which can replace it in both functions (predeterminer modifier and modifier within AdvP), and is uncontroversially an NP in both cases.⁴⁰

4. NON-STANDARD USES

In this section we illustrate uses of *once* which we would consider non-standard (and mark as such with the annotation ‘!’), but which are consistent with the compound determinative analysis.

Consider first the attested examples in (36):

- (36) (a) !I’m talking about a speeding ticket here. Since almost everyone has been stopped by a cop once or another, that’s a good place to start.
 (b) !You have received this email because at once or another you entered the weekly draw at one of our portals or FFA sites.

[38] It should be noted that *two times*, in distinction to *twice*, also allows a comparison of inequality (*two times faster than ...*).

[39] For some speakers, nevertheless, the similarity between the two forms *once* and *twice* overrides these considerations and *once* can occur in the recitation of multiplication tables: %*once three is three*, %*twice three is six*, and so on.

[40] Quirk et al. (1985: 261) include *once* among the predeterminers on the basis of its use in expressions like *once a week*. This, however, assumes that *week* is the head here, whereas there are strong reasons for taking *once* as head. In the first place, we can drop *a week* but not *once* in clauses like *I met her once a week* (cf. *I met her once*, but not **I met her a week*). Secondly, we can replace *a week* by *per week*; *per* is a preposition, not a determinative, so in *once per week* the head could not be *week*.

In these examples, we have a past use of *once* which would more standardly be replaced by the analytic expression *one time*. The speakers here are allowing the internal 'one' element of *once* to be accessed by *or another*, which is a natural accompaniment of singulative *one*. There is no reason why this construction should not exist; compound determinatives allow the determinative base *some* to be accessed in just this way (*somebody or another, something or another, somewhere or another*).⁴¹ Particularly significant is (36b), which allows *once* to be preceded by the preposition *at* and would be totally incompatible with an adverb analysis.

Secondly, in (37) we have an interesting blend construction:

- (37) (a) !This is the once and only time you will use the User Name and password supplied by your instructor.

Here *once* would naturally be regarded as the first element of a coordinate attribute with *only* as the second element; however, **the once time* is ungrammatical. The construction can therefore only have the grammatical structure *the [[once] [and [only time]]]*, where *once*, a nominal with the form of a compound determinative, is coordinated with the nominal *only time*. However, the influence of the construction *the one and only time* is clearly visible here.

Finally, as a non-standard American rather than a British usage, we note that it is possible (at least for some speakers) for multiplier *twice* as pre-determiner to be itself preceded by the definite article. Two examples are given in (38):

- (38) (a) !As some piano strings are rigid and thick, the string dividing points at which no vibration occurs have a certain length. If vibrations occur between a string dividing point and string end, vibration will occur over a length little [sic] shorter than the half of the original string length. This causes the second harmonic's frequency to be slightly higher than the twice that of the fundamental.
- (b) !The package offers the twice the amount of web space as our 'Standard' hosting package for businesses, and more than twice the number of e-mails, all at half the price.

This usage is obviously consistent with an analysis of multiplier *twice* as a compound determinative; here *twice* functions as fused modifier-head in an NP with *the* as determiner. The construction is totally incompatible with the traditional analysis of multiplier *twice* as an adverb.⁴²

[41] *Other* is more usual in coordinations with these *some* forms, but *another* is certainly well attested.

[42] Example (38b) also illustrates an interesting blend between the constructions of (35a), where the head *amount* is followed by a relative clause (*we did*), and (35b), where there is

5. DISTINCTIVE PROPERTIES OF FF

In section 1, we demonstrated the distinctive properties of FF and its analytical advantages in a variety of English constructions, concluding with the analysis of compound determinatives of the *somebody* type. In sections 2–4, we argued in detail that *once* (in all but its sequential use) and *twice* should also be analysed as compound determinatives. The constructions in which they occur exhibit all the characteristic properties of FF, which we recapitulate in (39):

- (39) (i) In FF, a single lexical or phrasal category Y(P) simultaneously realizes two functions.
 (ii) FF is permitted in a category XP only between the head of XP and either an immediate dependent of XP or an immediate dependent of the immediate dependent of XP.
 (iii) The fused functions are adjacent.
 (iv) The category Y(P) is typically not identical to XP.
 (v) The category XP is a projection of the category of the ultimate head in any counterpart construction.
 (vi) The category Y(P) is the category of the dependent in any counterpart construction.

In simple cases, constructions involving FF can look superficially similar to other marked construction types, but the above properties clearly demarcate FF from these. We will conclude, therefore, by briefly comparing FF with (a) incorporation, and (b) hybridization.⁴³

a comparative *as* phrase licensed by a preceding *as*. The standard alternatives to (38b) would be: (i) ... *twice the amount of web-space that our 'Standard' hosting package for businesses offers*, and (ii) ... *twice as much web space as our 'Standard' hosting package for businesses*.

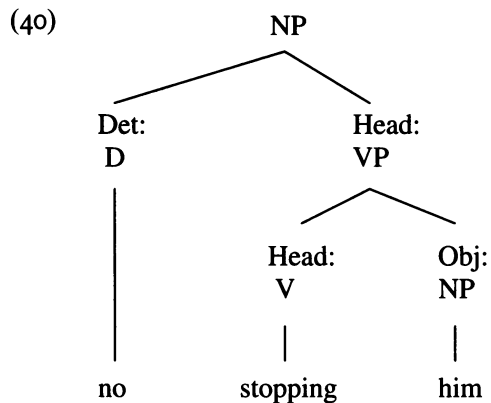
[43] An anonymous *JL* referee also makes the interesting suggestion of a comparison with reanalysis, popular from the 1970s to the 1990s. In reanalysis, a single string is associated with two (or more) tree structures. The classic example is the dual structure associated with prepositional verbs in English, often attributed to Chomsky's 1974 Amherst lectures but also essentially the analysis in Quirk, Greenbaum, Leech & Svartvik (1972). For the purposes of constructions like interrogative fronting, a string such as *rely on the bank* is analyzed as a VP consisting of a verb and a PP, e.g. [_{PP} *On which bank*] *are you* [_V *relying*]? On the other hand, in passive constructions the same string is analyzed as a VP consisting of a prepositional verb and an object: [_{NP} *This bank*] *can't be* [_V *relied* [_P *on*]]. One important similarity between reanalysis and FF is that both require string adjacency (see the discussion of reanalysis in van Riemsdijk 1998), and both are in that sense more restrictive than head-movement accounts of the same data (for which adjacency has to be stipulated). However, while both FF and reanalysis associate particular strings with two or more functions, in FF only a single tree structure is involved and one constituent is assigned a dual function in that single structure. Note for example that if, in a fused determiner-head structure realized by a compound determinative, we were to attempt to associate the compound determinative with one tree in which it was the determiner and another in which it was head, each tree would individually violate some principle of tree structure. In particular, the tree in which the compound determinative was determiner would (in our framework) violate the principle that trees be headed. In reanalysis, both trees are themselves legitimate structures.

Firstly, the compound nature of *once* and *twice* might suggest an alternative analysis in which the noun base *ce* is merged with the determinative bases *on-* and *twi-* by incorporation. Incorporation, however, has only one property which resembles the properties in (39). To begin with, incorporation, whether treated as a syntactic phenomenon (Baker 1988) or as morphological compounding (Rosen 1989, Spencer 1995, Anderson 2005: chapter 9), is correctly described as the merger of two zero-level categories in a single lexical item which has a unique function.⁴⁴ In the classic examples of incorporation, a theme or patient noun is incorporated into a verb to yield an output which has the regular functions of any intransitive verb, e.g. 'fish-kill'. In corresponding non-incorporated constructions, in which the noun is expressed separately as an object, the noun involved in incorporation is the head of the object (not any dependent). A schematic example would be incorporated 'father fish-kill son' (= 'father killed son's fish'), compared with unincorporated 'father kill son fish'. Notably, the incorporated noun is not necessarily adjacent to the verb, and the category of the merged word is verb (not noun). What is more, incorporation is not permitted to incorporate a phrasal category: we never find examples like '*father son-fish-kill'. The only property whereby incorporation bears any resemblance to FF is therefore property (v): after incorporation, the result of merging a noun into a verb is a verb which, as is normal, projects a VP or clause.

Finally, FF has some affinities with hybridization, a phenomenon characteristically found in nominalizations where the top of the construction is nominal and the bottom verbal. Hybrid constructions are not typical of modern English, but can be found in examples such as *there's [no stopping him]* (see *CGEL*: 1189 for further examples), where the whole construction is an NP containing the determiner *no*, but the head is a verb (as shown by the direct object *him*). In *CGEL* terms, the analysis of hybrid constructions is straightforward: at some point a verbal category occurs in a function normally filled by a nominal one.⁴⁵ The analysis of *no stopping him* is then:

[44] In Baker (1988) syntactic incorporation is assumed to be productive and not subject to lexical idiosyncrasy. This assumption would on its own rule out any analysis in which *once* and *twice* are formed by syntactic processes (e.g. head-to-head movement).

[45] The structure shown in *no stopping him* – an NP with a VP head – is similar to the one proposed in Pullum (1991) for constituents like *his having won the race*, which *CGEL* analyses as a gerund-participial clause with a genitive subject. But in the hybrid construction the initial constituent is a determinative, not a genitive NP. We are taking the view that VP-headed NP structure is appropriate for the hybrid cases, which had an anomalous character under Pullum's account, but not for gerund-participial clauses. For discussion of these and a further range of hybrid ('mixed category') constructions, see *inter alia* Bresnan (1997), Malouf (2000), Hudson (2003) and Blevins (2005). Bresnan's LFG analysis of these constructions invokes the notion of head-sharing, which allows heads of different categories to link their functional information.



The similarity with FF is that at a particular node, an unexpected category appears as head (here a VP as head of an NP). However, there is no fusion of functions in this case.

In conclusion, then, fusion of functions is a natural feature of the *CGEL* framework, in which function and category are systematically distinguished. Fusion of functions has clear conceptual and empirical advantages over analogous null-head analyses for a variety of English construction types. Constructions involving fusion of functions are clearly demarcated from other types of construction in which categories are merged or which have unusual heads. The detailed analysis we have given of *once*, *twice* and *thrice* provides further empirical evidence for the existence of FF as a distinctive syntactic construction, and implicitly supports syntactic frameworks which treat functions and categories as distinct primitives.

**URLs or printed sources of attested examples
(websites accessed DATE)**

- (16a) http://www.ciao.co.uk/Alphabet_Diets_The_Y_Diet_Review_65405/SortOrder/2
- (16b) <http://pressforword.tripod.com/adm/interstitial/remote.html>
- (16c) <http://toddlerstoday.com/interact/momstalk/00014.htm>
- (16d) <http://www.divestyle.co.uk/News/>
- (16e) http://www.cwrl.utexas.edu/~slatin/dillon/dillon_102398.htm
- (16f) <http://www.btinternet.com/~hognosesam/bitsofstuff/bitsofstuff/pulleys.htm>
- (17) <http://www.dsse.ecs.soton.ac.uk/newsletter/issues/2.html>
- (23) http://divinity.library.vanderbilt.edu/burns/2701_01/lectures/15marriage.html
- (26) <http://www.mysiemens.com/setters/house.html>
- (27b) <http://pages.ivillage.com/mellstew/id31.html>
- (27c) http://www4.gvsu.edu/toppera/Reviews/Keefe_Software_Reveiw.htm
- (28b) <http://archive.mail-list.com/secretsoflife/>
- (29a) <http://www.firstthings.com/ftissues/ft0010/public.html>
- (29b) http://www.trishandphill.optic.com/virginia/virginia_may11.htm
- (33a) Andrew Rawnsley, The Observer, Sunday July 22, 2001
- (33b) http://www.elmete.com/_disc4/000000of.htm
- (33c) Tom Clarke MP, Hansard, UK Parliament 24 Jan 1995
- (33d) http://www.whatdoiknow.org/mt/mt-comments.cgi?entry_id=431
- (33e) <http://www.duluthsuperior.com/mld/duluthtribune/news/opinion/5636478.htm>
- (34a) <http://www.physics.umd.edu/robot/feynm/fphoto.html>
- (34b) <http://homepages.goldsmiths.ac.uk/genuki/MDX/Islington/HollowayHistory.html>
- (36a) <http://www.intertext.com/v6n2/business.html>
- (36b) <http://mail.nl.linux.org/spamfilter/2002-02/msg00000.html>
- (37) http://www.sonoma.edu/it/ITS/webct/add_course.html
- (38a) <http://www.novelmusic.com>
- (38b) <http://www.avantac.com/hosting/nonprofit.htm>
- fn.26 <http://www.amazon.co.uk/exec/obidos/ASIN/3931126242/>
- fn.34 <http://www.gurteen.com/gurteen/gurteen.nsf/o/E2D26C73DC79DDF980256C2D00475B5F/>

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