

NOUN PHRASE MODIFIERS REALIZED BY CLAUSES IN ENGLISH AND BULGARIAN SCIENTIFIC TEXTS

Bilyana Ovcharova
University of Forestry, Sofia

English noun phrase modifiers realized by clauses can be of two types: modifiers realized by relative clauses and modifiers realized by infinitival and participial clauses, i.e. by nonfinite clauses. Both types can realize restrictive and nonrestrictive modification. The paper discusses some issues regarding the description of relative clauses and NP modifying nonfinite clauses in the grammar traditions of English and Bulgarian. Also presented are structures with participial NP modifying clauses in pre-head position in both languages. The focus of the study is the *ing*-clause, its position in the sentence, and the implications this has on its meaning. The analyses are based on authentic examples from scientific publications in English and Bulgarian in the field of forestry and landscape architecture, and special attention is devoted to translation of English *ing*-clauses in Bulgarian.

Key words: NP clausal modifiers, participial *ing*-clause, scientific style, English, Bulgarian

1. Noun phrase modifiers realized by clauses

English noun phrase modifiers realized by clauses can be of two types: modifiers realized by relative clauses and modifiers realized by infinitival and participial clauses, i.e. by nonfinite clauses.

1.1. The relative clause

Relative clauses are dependent elements in the structure of noun phrases. The main structural characteristic of English relative clauses is that “they are related by their form to an antecedent”, either containing a *that*-relative, a *wh*-relative or a zero relative (Huddleston & Pullum 2002: 1034). Such relative clauses are always finite clauses with one exception: the infinitival relative clause (Huddleston & Pullum 2002: 1067).

In [1] below the relative clause is a *that*-relative; in [2] it is a non-*wh* infinitival relative:

[1] *Gymnosperms are plants that produce seeds in the open spaces of cones.*
'Голосеменните са растения, които образуват семена си на открити места в шишарките.'

[2] *It was the longest avenue of trees to be found in Europe.*
'Това беше най-дългата алея с дървета, която можеше да се види в Европа.'

In Bulgarian, relative clauses (*подчинени определителни изречения*) have two subtypes that distinguish between clauses linked to the noun phrase head (1) with a relative word, and (2) without a relative word. Коева (2017: 197) suggests the terms *релативни определителни* or *относителни определителни изречения* (relative defining clauses) for subtype 1.

Subtype 2 is marked by the presence of interrogative pronouns or adverbs, the conjunctions *дали* (whether, if), *че* (that) and *да* (to) (GSBKE 1994: 305, Коева 2017: 197):

[3] *She will not dispute the fact that the company made profit.*
'Тя няма да оспорва факта, че компанията е реализирала печалба.'

[4] *They made an attempt to convince her.*
'Направиха опит да я убедят.'

In English, clauses as these two examples (as well as the other realization of subtype 2) are not classified as relative but as content (nominal) as they function as a complement and not a modifier in the NP (Huddleston & Pullum 2002: 439, 964, 1259). It seems logical that such a distinction should be also made in Bulgarian.

Relative clauses in both English and Bulgarian are classified as restrictive and non-restrictive on the basis of whether their function is to delimit the set denoted by the antecedent or add information that does not have such identifying function.

The relative clauses in [1] and [2] above are restrictive, whereas the clause in [5] below is non-restrictive:

[5] *Gymnosperms, which are the topic of my presentation, are among the oldest living organisms.*
'Голосеменните, които са темата на моята презентация, са сред най-старите живи организми.'

Non-restrictive relatives are also termed *supplements* in English (Huddleston & Pullum 2002: 1035) i.e. parts that are not as integrated into

the main clause as the restrictive relatives in the sense that the information they contain is not identifying. In Bulgarian examples of such non-restrictive relative clauses are included in the sections on disjuncts (вметнати конструкции) in *The Grammar of Modern Bulgarian Standard Language*, vol. 3 *Syntax* (GSBKE 1994: 243).

1.2. The non-finite clause as an NP modifier

The non-finite clauses in English that can occur as post-head modifiers in NPs are *to*-infinitive, *ing*-participle and past participle clauses as shown in the examples below:

- [6] *It is one of the most beautiful flowers to grow in your garden.*
 ‘Това е едно от най-красивите цветя, което да отглеждате в градината си.’
- [7] *Water storage on a grand scale occurs in a few tree species possessing unusually large trunks.*
 ‘Складирание на вода в изключителни мащаби се осъществява от няколко дървесни вида, притежаващи необичайно големи стволоче.’
- [8] *Subdominant species enjoy the protection given by their more vigorous competitors.*
 ‘Субдоминантните видове се радват на защитата, осигурена от по-енергично растящите им конкуренти.

The *to*-infinitive clause in [6] is different from the one in [4], in which the subordinator *да* /*to*/ is used in the Bulgarian version. As mentioned earlier such *to*-infinitive clauses are examples of infinitival relatives.

In English grammar books subordinate clauses as these in [7] and [8] above are not referred to as relative clauses but as instances of post-modification in NPs, and they can be both restrictive and non-restrictive (the examples above show restrictive clauses).

In Bulgarian, participial clauses in the structure of NPs are regarded as detached parts (обособени части) (GSBKE 1994: 234-7), which are defined as modifiers that are intonationally separated from the rest of the sentence and are semantically and structurally omissible. In Boyadzhiev & Kutsarov & Penchev (1998) participial clauses are not discussed in the sections on relative clauses (pp 580-6); an example of a non-restrictive participial clause is given in the section on detached parts (p 560), and it is mentioned in passing that participial clauses may occur as pre-head modifiers in NPs (p 525).

In section 2 below are shown original Bulgarian examples from scientific texts exemplifying restrictive modification by participial clauses.

2. Restrictive modification by nonfinite clauses

In the English examples [6]-[8] above and in the two Bulgarian examples [9] and [10] below the information in the subordinate clauses limits the set of referents to which their respective NPs refer, i.e. these clauses are not examples of detached parts, as defined by Bulgarian grammar books, as they are not semantically omissible.

[9] *Системата е подходяща за туристи, планиращи екскурзионни пътувания.*

'The system is suitable for tourists planning group hikes.'

[10] *Целта на разработката е да се установи разликата в продуктивността на иглолистните насаждения, създадени извън естествения им ареал, с тази на автохтоната дървесна растителност.*

'The study objective is to determine the difference between the productivity of coniferous plantations established outside their natural range and that of natural woodlands.'

In Bulgarian such clauses may also be placed in pre-head position:

[11] *Количеството на постъпващите в екосистемите отлагания варира във времето и пространството.*

'The amount of sediments entering the ecosystem varies with time and space.'

[12] *Разположените близо до селищата гори загубват високостъблени си характер и се превръщат в издънкове.*

'Forests located near urban centers are no longer high forests and become coppice.'

Placing clausal modifiers in pre-head position 'enhances their integrity' in the NP and emphasizes their identifying function with regard to the referent of the respective NP.

In English such pre-modification is also possible but is limited mainly to two-word compounds such as: *seed-dispersing animals, internode-elongating hormone, rapidly closing canopy, spring-grown varieties, moss-grown cottages*. Regardless of the two-word structural limitation, the pattern is very productive, and in many cases the respective Bulgarian expression is not that concise because it requires the use of preposition: *moss-grown cottages* vs *обраснали в мъх къщурки*.

The compounds in English are hyphenated because, if not, they may be ambiguous:

- [13] *The hormone controlling phototropism is named auxin.*
 ‘Хормонът, контролиращ фототропизма, се нарича ауксин.’
- [14] **The hormone controlling phototropism is named auxin.*
 *‘Контролиращият хормона фототропизм се нарича ауксин.’

In [13] the *ing*-clause realizes a post-head modifier; if understood as an NP with a pre-head modifier as in [14], this would be semantically incorrect.

Subordination by *ing*-clauses poses difficulties for the non-native speakers of English and is the focus of the next section.

3. Subordination with *ing*-clauses in English: position and meaning

Non-finite *ing*-clauses in English can occur in any sentence position: initial, mid, and end positions. Such subordinate clauses do not possess an explicit marker for subordination (complementizer, relativizer or subordinating conjunction) to signal the type of subordinate clause: nominal, relative or adverbial. Also, most *ing*-clauses in English do not have a subject, and for Bulgarian learners the identification of the subject may cause difficulties.

3.1. *Ing*-clauses in initial position

Initial *ing*-clauses can have two very distinct functions: (1) they can be predicative adjuncts as in example 0 or (2) other types of adjuncts (manner, reason, condition, and etc.) as in [16], where the *ing*-clause is an adjunct of manner:

- [15] *Growing up to 150 feet (46 meters), beech prefers moist, rich soil and tolerates shade.*
 ‘Достигащ до 46 метра (150 фута) на височина, букът предпочита влажна, богата почва и понася сянка.’
- [16] *Using the increment borer, the US Forest Service located some ancient bristlecone pines (*Pinus longaeva*) at the treeline of the White Mountains of east-central California.*
 ‘Използвайки преслеров свредел, Горската служба на САЩ локализира няколко древни бора *Pinus longaeva* на линията на гората в Белите планини в източно централна Калифорния.’

In initial position *ing*-clauses are regarded as detached parts, and structurally cannot be part of NPs, though, when functioning as a predicative adjunct, they supply information about the referent of the NP in subject function. In some cases, when translating such predicative adjuncts

in Bulgarian, they may be integrated in the NP as pre-head modifiers as in example [17]

- [17] *Living in the soil, decomposers such as fungi free the nitrogen from the carbon so that it can reenter the cycle.*
‘Живеещите в почвата редуценти, например гъбите, освобождават азота от въглерода, така че той да постъпи отново в кръговрата.’

3.2. *Ing-clauses in mid position*

In mid position *ing*-clauses only function as postmodifiers to the NP realizing the subject. Such clauses can be either restrictive, as in [18], or unrestrictive, as in [19]:

- [18] *Two processes taking place at a cellular level contribute to a plant’s growth.*
‘Два процеса, протичащи на клетъчно ниво, допринасят за растежа на растението.’
- [19] *The tallest maple species, reaching about 120 feet (37 meters), is the sugar maple (*Acer saccharum*).*
*‘Най-високият вид клен, достигащ до 37 метра (120 фута) на височина, е захарният клен (*Acer saccharum*).’*

3.3. *Ing-clauses in end position*

Participial *ing*-clauses in end position may realize restrictive modification of the nouns:

- [20] *We recognize beech by its smooth, thin bark and fruit consisting of nuts enclosed in a bur.*
Можем да разпознаем бука по гладката му, тънка кора и плода, състоящ се от жълъди, обвити в бодлива семенна кутийка.
- [21] *Roots and shoots are frequently thought of as different entities growing in opposite directions.*
Корените и наземните части често се разглеждат като различни системи, разрастващи се в противоположни посоки.

Now let’s look at examples in which an end *ing*-clause, occurring after an NP, is preceded by a comma. In [22] and [23] the respective translations in Bulgarian realize: a non-restrictive relative clause in (a), a sentential relative

clause in (b), an adverbial clause with a subordinating conjunction in (c), and an adverbial clause with a converb (деепричастие) in (d).

[22] *By 2009, some of these seedlings had grown into saplings, causing understory light to decline to less than 60% for the smaller oaks.*

a. *‘До 2009 г. някои от тези поници израснаха във фиданки, които намалиха светлината в подлеса под 60% за по-малките дъбове.’*

b. *‘До 2009 г. някои от тези поници израснаха във фиданки, което намали светлината в подлеса под 60% за по-малките дъбове.’*

c. *‘До 2009 г. някои от тези поници израснаха във фиданки, като намалиха светлината в подлеса под 60% за по-малките дъбове.’*

d. *‘До 2009 г. някои от тези поници израснаха във фиданки, намалявайки светлината в подлеса под 60% за по-малките дъбове.’*

[23] *The preparatory cuts removed the suppressed and smaller intermediate trees, creating an open understory.*

a. **‘Подготвителните сечи премахват подтиснатите и по-малките средно високи дървета, които създават отворен склоп.’*

b. *‘Подготвителните сечи премахват подтиснатите и по-малките средно високи дървета, което създава отворен склоп.’*

c. *‘Подготвителните сечи премахват подтиснатите и по-малките средно високи дървета, като създават отворен склоп.’*

d. *‘Подготвителните сечи премахват подтиснатите и по-малките средно високи дървета, създавайки отворен склоп.’*

In [22] all translation equivalents are grammatically and semantically well-formed whereas in [23](a) the equivalent is semantically incorrect. The *ing*-clauses in [22] and [23] do not have an explicit subject. According to the rules of grammaticality in English, their subject is co-referential with the subject of the respective main clause¹. Therefore, an *ing*-clause as the one in the two examples may not realize NP post-head modification. It is then not surprising that [23](a), though grammatically well-formed, is semantically incorrect; but it is interesting that [22](a) is both grammatically and semantically acceptable. It is this clause semantics that permits translation variant (a), more precisely the fact that the subject (*some of these seedlings*) and the NP (*saplings*) share the same referent.

¹ There are instances in which the subject of the *ing*-clause can only be inferred semantically *But, judging from their reaction, the decision was a complete surprise to them.* (Huddleston & Pullum 2002: 1266)

As noted above the *ing*-clauses in [22] and [23] occur after a NP and are preceded by a comma. Such punctuation is typical of supplementary (non-restrictive) finite relatives and *ing*-supplements (Huddleston & Pullum 1064 & 1265-6). As it is typical of such clauses, they do not explicitly indicate their semantic relation to the main clause, and both sentences may be re-written as sentences with coordination ([22]...*some of these seedlings had grown into saplings and had caused understory light to decline...* and [23] *The preparatory cuts removed the suppressed and smaller intermediate trees, and created an open understory*). Similarly to non-restrictive finite relatives, the *ing*-clauses in [22] and [23] have continuative function, serving to develop the narrative. The text following the sentence in [22] continues with information about the amount of light available and there is even a repetition of the verb *decline*:

[22'] *By 2009, some of these seedlings had grown into saplings, causing understory light to decline to less than 60% for the smaller oaks. Photosynthetically active radiation will continue to rapidly decline, and in a few years, understory light levels will be less for the oaks than they are in the first removal cut treatment.*

Translation variants (b)-(d) are more or less semantically equivalent. The sentential relatives in examples (b) elaborate on the content of the main clause, making a comment, and may be the only possible translation variant in certain cases (see example [24] below). It is interesting that, to account for the semantics of sentential relative clauses, Quirk et al. (1985: 1118-20) discuss them in the chapter on subordinate clauses, after comment clauses realizing parenthetical disjuncts, instead of presenting them in the section devoted to the structure of NPs.

Translation equivalents (c) and (d) are both adverbial subordinate clauses. In examples (c) the emphasis is placed on the consequence expressed by the conjunction *kamo /as, by, thus/*; in sentences (d), in which converbs are used, the subordinate clauses express not only consequential but also simultaneous actions, a meaning that is brought to the foreground. It should be noted that sentential relative clauses in examples (b) have as an antecedent the predication in the first clause whereas adverbial clauses do not have antecedents but express the meanings discussed. These properties of the respective clause type limit the Bulgarian translation equivalents of English *ing*-clause in some cases. Such an example is [24] in which, as shown by its translation equivalents in Bulgarian, the linguistic means are a sentential relative as in (a) or an adverbial clause

with a conjunction and an added subject *това* (this) as in (b). Using a converb as in (c) is semantically incorrect.

- [24] *Hybrids were chosen for their resistance, and then backcrossed with other American chestnuts, making them 15/16^{ths} pure American chestnut. (file 16)*
- a. *‘Хибридите бяха избрани заради устойчивостта им и след това бях обратно кръстосани с други американски кестени, **което** ги прави 15/16^{ми} чисти американски кестени.’*
 - b. *‘Хибридите бяха избрани заради устойчивостта им и след това бях обратно кръстосани с други американски кестени, **като това** ги прави 15/16^{ми} чисти американски кестени.’*
 - c. **‘Хибридите бяха избрани заради устойчивостта им и след това бях обратно кръстосани с други американски кестени, **правейки** ги 15/16^{ми} чисти американски кестени.’*

In other cases, a translation equivalent with a sentential relative is grammatically incorrect, as in [25](a). Using an adverbial clause with the conjunction *като* (as, by, thus), as in [25](b), or a converb, as in [25](c), renders correct translations.

- [25] *This low maintenance, fruit-producing tree withstands heat, drought, and alkaline soils, growing best in zones 8-11 outdoors. (internet)*
- a. **‘Това невзискателно, плодно дърво издържа на топлина, суша и алкални почви, **което** расте най-добре в зоните от 8-11, на открито.’*
 - b. *‘Това невзискателно, плодно дърво издържа на топлина, суша и алкални почви, **като** расте най-добре в зоните от 8-11, на открито.’*
 - c. *‘Това невзискателно, плодно дърво издържа на топлина, суша и алкални почви, **растейки** най-добре в зоните от 8-11, на открито.’*

Examples [22]-[25] show that in English there is successful disambiguation strategy applied concerning *ing*-clauses in end position, following a NP and preceded by a comma. Such clauses are never non-restrictive relative clauses unless the preceding NP is co-referential with the sentence subject (example [22](a)). Such coreference is observed in clauses with the copula verb *be*:

- [26] *Fir is the leading dominant softwood species in some forests, often comprising more than 50% of the basal area of these stands. (file 16)*

- a. ‘Елата е водещият доминантен иглолистен вид в някои гори, който представлява над 50% от кръговата площ в тези насаждения.’
- b. ‘Елата е водещият доминантен иглолистен вид в някои гори, като представлява над 50% от кръговата площ в тези насаждения.’
- c. ‘Елата е водещият доминантен иглолистен вид в някои гори, представяйки над 50% от кръговата площ в тези насаждения.’

In example [26] the *ing*-clause is ambiguous as to whether it realizes nonrestrictive modification of the NP head *species*, which in the Bulgarian translation is obvious from the agreement in gender of the relative pronoun *който* (*which*) in variant (a), or the *ing*-clause is an adverbial clause allowing a translation with a subordinating conjunction as in (b) or a converb as in (c).

4. Conclusions

1. Participial clauses realizing postmodification in NPs can be both restrictive and nonrestrictive, i.e. integrated in the NP structure or detached parts.
2. In Bulgarian, participial clauses may occur in pre-modifying position; in English, only two-word compounds may be found in such position, though some predicative adjuncts in initial position appear to have the similar function as the Bulgarian pre-modifying participial clauses.
3. In English, participial *ing*-clauses in mid-sentence position are either restrictive or nonrestrictive NP modifiers; they are not adverbial subordinate clauses.
4. In English, participial *ing*-clauses in end sentence position when occurring after an NP followed by a comma have the function of a sentential relative or adverbial subordinate clause; only when the preceding NP is co-referential with the NP functioning as subject may such clauses realize cases of nonrestrictive modification.

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