

On restrictions on the use of non-restrictive infinitival relative clauses in English

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This paper deals with non-restrictive infinitival relative clauses (NIRCs) in English (e.g. An independent review, to be funded by the health authority, has been commissioned). The purpose of this paper is twofold: (i) to give an accurate description of the semantic properties of the NIRC on the basis of the British National Corpus, and (ii) to elucidate restrictions on the use of this construction. My corpus-based approach will clarify four types of shades of meaning expressed by this construction are equal to those expressed by IS TO construction (i.e. plan, necessity or appropriateness, future in the past, and possibility). I will stress that NIRCs are used only when they have one notional category (i.e. notional subject/object), which is highly likely to be a notional subject of the infinitive, and denote one of the shades of meaning rather than causality.

Keywords: non-restrictive clauses, infinitival relative clauses, meaning of *to*-infinitives, the British National Corpus

1. Introduction

This paper deals with the non-restrictive infinitival relative clause (henceforth, NIRC) in English (e.g. An independent review, *to be funded by Ealing council and*

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Ealing health authority, has been commissioned. (BNC: A96 443))¹. The discussion of NIRC has been neglected by linguists, although there have been many publications on restrictive infinitival relative clauses (e.g. *There are a lot of things to think about*) on the basis of various approaches (c.f. Berman 1974; Bhatt 2006; Fleisher 2011; Geisler 1998; Kjellmer 1975; Nagahara 1990; Rohdenburg 1995). This paper will bring us one step closer to a full characterisation of the nature of the NIRC in English through a careful and extensive empirical scrutiny of the construction. The main purposes of the following discussion are: to give an accurate description of the semantic properties of the NIRC on the basis of corpus data, and to shed light on restrictions on the use of this construction.

The organisation of this paper is as follows. Section 2 is devoted to an examination of previous analyses of the NIRC in English. I will argue that previous analyses are inadequately supported because their data sets are too small to bear out their explanations. Section 3 is concerned with the semantic properties of NIRC: I will discuss the shades of meaning expressed by NIRC in English, dividing them into four types. The empirical validity of my analyses in this and the next section rests on the corpus data which I have extracted from the British National Corpus (BNC). Section 4 discusses the syntactic variations of NIRC in English. I will show that NIRC can occur in both the passive and active voice, contrary to a previous analysis which contends that NIRC can only occur in the passive voice. In section 5, our attention will be directed to the explication of the mechanisms which trigger the use and interpretation of NIRC. In order to shed light on this problem, I will take into account how the hearer parses a *to*-infinitive clause as an NIRC. Section 6 concludes this paper with a brief summary.

2. Previous analyses of NIRC

NIRC has been paid little attention in research on relative clauses. There have been only a handful of previous analyses of this construction, but all of them seem to be inadequate in various respects. In this section, I will examine these previous analyses and point out their inadequacies.

¹ Here and elsewhere in this paper, italics in corpus sentences quoted from the BNC are my own insertions, used to highlight the relevant parts of the examples.

Huddleston (1971: 251) gives an account of the syntactic restrictions on NIRC. His corpus data contains 36 examples of restrictive IRCs but only two of NIRC, as in:

- (1) In the uncomfortable region from 10 to 4 °K, helium gas thermometry is often used, and below 1°K magnetic methods, *to be explained later in this chapter*, are employed.

Huddleston (1971: 251) explains that the non-restrictive infinitive clause is possible ‘only when the subject is relativised: thus the restrictive *the man to see is Smith* is grammatical, but not the non-restrictive **the man, to see, is Smith*.’

Quirk *et al.* (1985: 1270) state that non-restrictive postmodification can be achieved by an infinitive clause and present the following example:

- (2) This scholar, *to be found daily in the British Museum*, has devoted his life to the history of science. [‘who can be found daily in the British Museum...’]

According to Quirk *et al.*, a nonrestrictive infinitive clause such as (2) should correspond to a relative clause where the relative pronoun is subject (i.e. *who* in (2)). Therefore, the NIRC in (2) cannot be converted to the active voice as follows:

- (3) *This scholar, *to find daily in the British Museum*, has devoted his life to the history of science.

Nagahara (1990: 62-3), referring to the above comments by Quirk *et al.*, goes so far as to suggest that the antecedent of the NIRC seems to be restricted to the subject of a passivised *to*-infinitive (i.e. a passivised NIRC).

Finally, Emonds (1979) gives a more detailed analysis of NIRC and presents the following examples of this construction:

- (4) a. *Mary and John, (*for someone like you*) *to teach algebra to*, are now coming downstairs.
 b. The girls (*for someone like you*) *to teach algebra to* are now coming downstairs.
 c. This room, *for you to teach algebra in*, adjoins mine.
 d. ? This room, *to teach algebra in*, adjoins mine. (Emonds 1979: 237)

Emonds states that ‘infinitival appositive relatives’² exist just when finite appositive relative clauses of the form “WH-morpheme + finite form of *be* + infinitive” exist’. This amounts to saying that the difference in the acceptability judgments between (4a) and (4c) is analogous to the differences between the finite non-restrictive relative versions, as in (5a) and (5b) below:

- (5) a. *Mary and John, who are (*for someone like you*) *to teach algebra to*, are now coming downstairs.
 b. This room, which is (*for you*) *to teach algebra in*, adjoins mine.
 (Emonds 1979: 237.)

However, I suspect that Emonds’s acceptability judgment may not be generalisable, because my participants (native speakers of English) are unanimous in not accepting sentence (4c). To examine the empirical validity of my participants’ acceptability judgments of sentence (4c), I searched my corpus data for just such a syntactic sequence ‘, (comma) + *for* + noun/pronoun + *to*-infinitive’. The BNC contains 359 examples of this sequence, but only one of them can be interpreted as an example of an NIRC (see (6a)): the others are concerned with other grammatical constructions: an adverbial clause (see (7a)), a complement of a noun (7b), an extraposed subject of the sentence (7c), etc. Here and elsewhere in this paper, examples marked with an apostrophe signify a finite relative clause, which corresponds to NIRC examples from the BNC.

² Emonds’s term ‘infinitival appositive relatives’ refers to NIRCs.

- (6) a. Peace and tranquility reign in the well-kept grounds, which offer numerous tables and chairs in pleasant shady corners, *for guests to relax in*.

(BNC: CH5 4489) [NIRC]

a'. = ... in pleasant shady corners, in which guests can relax.³

- (7) a. In one method, the recordings give dialogues, without pauses, *for learners to study and imitate*.

(BNC: H0Y 1167) [adverbial]

- b. There is a general tendency, Marx claimed, *for wages to stick at a general exploitative level*, except when some skills are temporarily scarce.

(BNC: EDH 748) [complement]

- c. It is better, though, *for you to restrain your natural impatience to make a start, and take time instead to read the book of instructions before you begin pressing any of the buttons*.

(BNC: GBP 173) [extraposed subject]

To summarise, the previous analyses of the NIRC suggest that this construction is restricted to the passive voice (Nagahara 1990) and is possible only when the subject is relativised (Huddleston 1971; Quirk *et al.* 1985). Their analyses, however, are inadequately supported because their data sets are too small to bear out their explanations. They overwhelmingly hinge on linguists' introspection and intuition for the explication of the nature of NIRCs. Furthermore, they fail to give an account of semantic properties of NIRCs. In what follows, I will thus take a corpus-based approach in order to construct a more convincing characterisation of NIRCs from semantic and syntactic points of view.

³ One might say that the infinitival clause *for guests to relax in* in (6a) should be parsed as an adverbial clause, because there seems to be a purposive meaning in the clause. This infinitival clause, however, also functions as a "supplementary explanation" of the antecedent noun (i.e. *pleasant shady corners*), which is one of the main functions of non-restrictive relative clauses (see Huddleston & Pullum 2002: 1063-5). Therefore, the difference between NIRCs and infinitival adverbial clause may be a matter of degree rather than discrete categories.

3. Shades of meaning expressed by NIRC⁴s

In this section I will investigate the various shades of meaning expressed by NIRC⁵s, using data from the BNC. I collected 223 examples of NIRC⁵s from the BNC.⁵ The examination of these corpus data suggests that the shades of meaning of NIRC⁵s generally fall into four categories: *plan*, *possibility*, *necessity/appropriateness*, and *future in the past* (FiP), all of which can also be denoted by the so-called IS TO construction.⁶ This generates the hypothesis that the possibility of using an NIRC is linked to the potentiality of using a finite relative clause consisting of ‘*which (who) is to*-infinitive’ (the IS TO construction) (c.f. Akiyama 2004: 66). The four types of IS TO construction are illustrated as follows:

- (8) a. The Prime Minister *is to make a statement on Northern Ireland in Commons this afternoon*. (BNC: KM2 4) [Plan]
- b. HEALTH authorities *are to pay immediate compensation to the families of Allitt's victims*. (BNC: E9T 231) [Necessity]
- c. John *was never to see his son again*. (BNC: ATE 3089) [Future in the Past]
- d. And the answer to this *is not to be found in the histories of individuals*. (BNC: CMN 1149) [Possibility]

Table 1 below shows the frequency of each shade of meaning expressed by NIRC⁵s:

⁴ I do not consider it accurate to state that a particular NIRC has X or Y (discrete) meanings, but instead to say that a particular construction expresses several ‘shades of meaning’. This is because what a construction expresses is crucially contingent on the context and thus meanings of a construction are closely related to one another, and often difficult to separate.

⁵ I first extracted examples of the sequence ‘, (comma) + *to be*’ from the BNC, and got 4011 examples. Among the first 1000 examples out of these 4011 instances, I manually identified 223 NIRC⁵s.

⁶ The IS TO construction consists of a finite form of the verb *be* followed by *to*-infinitives, and expresses temporal meanings (i.e. plan and future in the past) and modalities (i.e. necessity and possibility) (see Goldberg and Van der Auwera 2012; Leech 2004: 70; Palmer 1990: 164).

Meanings	<i>Plan</i>	<i>Nec/Approp</i>	<i>FiP</i>	<i>Possibility</i>	<i>Ambiguous</i>	Total
Freq. & Percentage	147 (65.9%)	31 (13.9%)	12 (5.4%)	8 (3.5%)	25 (11.2%)	223 (100.0%)

Table 1. *Distribution of Shades of Meaning in NIRCs in Examples Extracted from the BNC*

I will now examine these shades of meanings in turn.

3.1 *Plan*

As Table 1 shows, *plan* is the most frequent shade of meaning expressed by NIRCs. Examples are:

- (9) a. This year's Christmas stamps, *to be issued from 14th November*, will feature Ely Cathedral, which is celebrating its 800th anniversary. (BNC: A50 696)
- a' = This year's Christmas stamps, which are to be issued from 14th November, will feature Ely Cathedral, ...
- b. In the case of the last round of the Young Cook of Britain competition, *to be judged on 17 October*, regional finalists were asked which famous person they would like to cook for. (BNC: A3C 259)

In example (9a), 'this year's Christmas stamps' are planned to be issued from 14th November. Here, it should be noted that the NIRC is used to refer to something that is going to happen in the future as a result of a plan, by somebody/something other than the antecedent noun of the NIRC (c.f. Leech 2004: 70).

3.2 *Necessity or Appropriateness*

There are 31 examples of NIRCs which express necessity or appropriateness (i.e. deontic modality) in my data. The NIRC with this shade of meaning can usually be paraphrased by a non-restrictive finite relative clause by using some modal expression such as *have to*, *is to*, *should*, or *ought to*.

- (10) a. It was recurring motif in the Newbolt Report, echoed by Leavis, that English was not just another school or university subject, *to be placed alongside geography or geology*. (BNC: A1A 843)
- a'. = ..., which should/is to be placed alongside geography or geology.
- b. Thereafter he was allowed only six boatloads of brushwood a year, *to be taken out under view of the bailiff*. (BNC: AS4 449)
- b'. = ..., which had to/were to be taken out under view of the bailiff.
- c. This led to a view of people as a cost, *to be controlled and administered*. (BNC: AM7 1065)
- c'. = ..., which had to/was to be controlled and administered.

3.3 *Future in the past*

My data contain 12 examples (5.4% of the whole data set) of NIRCs expressing *future in the past* (FiP). The distinctive feature of this shade of meaning is that it implies factuality while other shades of meaning (i.e. *plan*, *necessity/appropriateness*, and *possibility*) have an implication of non-factuality. It is semantically similar to resultative adverbial infinitival clauses (e.g. Their daughter, Pepita, grew up *to be a healthy, happy girl in St Vincent*. (BNC: BM0 163)). Situations denoted by the resultative adverbial infinitival clauses are interpreted as being factual. Examples of NIRCs expressing FiP are in (11a-b), both of which have an implication of factuality:

- (11) a. The occasion was a splendid one, *to be remembered afterwards as one of the high points of the Empire*. (BNC: ANR 420)
- a' = ... a splendid one, which was to be remembered afterwards as
- b. Early in the nineteenth century, John Rennie built the Humber Dock, *to be followed later by Prince's Dock (1829), Railway Dock (1846) and Victoria Dock (1850), with their bridges, locks and warehouses*. (BNC: B0A 1290)

In (11a) the NIRC (*to be remembered afterwards as one of the high points of the Empire*) can be paraphrased by a finite relative clause (*which was to be remembered...*). In this sentence, the speaker, at the moment of speaking, looks back to the moment of ‘the occasion’ in a past situation (TIME1 in Figure 1 below), and depicts ‘this occasion’ as being remembered in the future in a second past situation (TIME2). This explanation is summarised in Figure 1:

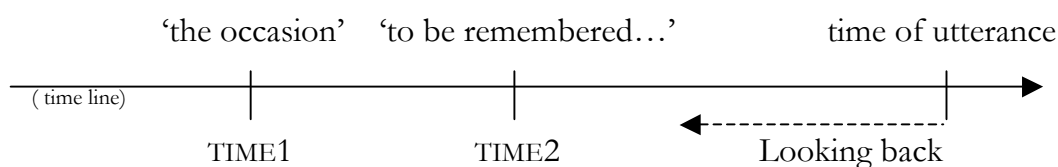


Figure 1. *Future in the past in (11a), above.*

Similarly, in (11b) the NIRC (*to be followed later by Prince’s Dock (1829), Railway Dock (1846) and Victoria Dock (1850), with their bridges, locks and warehouses*) can be paraphrased by a finite relative clause (*which was to be followed by...*). The speaker of this sentence looks back to the situation in a past when ‘John Rennie built the Humber Dock’ (i.e. TIME1 in Figure 2 below), and describes how the Humber Dock was later (relative to TIME1) followed by other Docks (i.e. TIME2 in Figure 2). The explanation of (11b) is encapsulated in Figure 2:

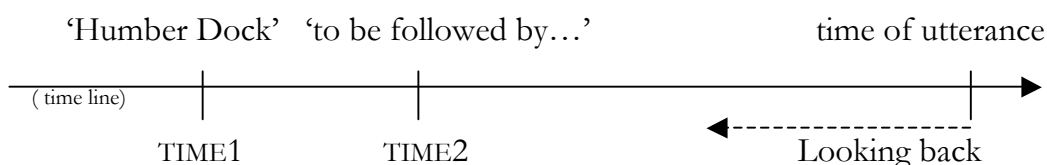


Figure 2. *Future in the past in (11b), above.*

3.4 Possibility

An NIRC can also express possibility, in most cases of which it can be paraphrased by a finite relative clause with the modal auxiliary *can* or the *is to* construction. The type of possibility expressed by NIRC can be categorised as Palmer’s (1990: chap.5; 2001: 76-77) dynamic possibility (i.e. subject-oriented or neutral (circumstantial) possibility; what is experientially possible).⁷ There are nine

⁷ Palmer (1990: 103-6) defines dynamic possibility as “what is experientially/reasonably possible”. On the other hand, deontic possibility is ‘what I (the speaker) permit’, and epistemic possibility is ‘what is

examples of NIRC's representing possibility in my data from the BNC. For example:

- (12) a. There is no end to the recounting of social ritual, communications, behavioural patterns, sensory perception and motor activity, *to be found among the creatures of this physical world, human or otherwise.* (BNC: BMY 1181)

a'. = ..., which can /are to be found among ...

The NIRC in the following example is highly likely to express circumstantial possibility, because the *when*-clause in (14) following the NIRC gives a clear indication of circumstances in which the event is possible (cf. Palmer 1990: 84):

- (13) Thatcherism makes intellectual liberty just another commodity, *to be enjoyed when there is no particular political or commercial or administrative price to be paid for it, but abandoned, with no evident grief, when the price begins to rise.* (BNC: 159 ASB)

3.5 *Ambiguous shades of meanings expressed by NIRC's*

Shades of meanings expressed by an NIRC are crucially contingent on the context, and thus there may be ambiguous meanings. The following examples reveal how much the shades of meaning expressed by NIRC's may overlap:

- (14) a. It said the extra charge, *to be taken as exceptional*, would lower its full-year profit due in May by about £25m. (BNC: AJ2 326)

[*to be taken as exceptional* = appropriateness or possibility?]

conceptually possible'. Palmer (1990: 83ff.) suggests that there are two subkinds of dynamic possibility, viz. neutral (or circumstantial) and subject-oriented possibilities. Neutral/circumstantial possibility is usually expressed by *is to* or *can* and merely indicates that an event is possible. The description 'circumstantial possibility' is more appropriate if there is a clear indication of the circumstances in which an event is possible. Subject-oriented possibility is concerned with the ability of the agent.

- b. The British Library Research and Development Department should, as soon as possible, appoint an information Officer for Use Education, *to be responsible for the collection and dissemination of information on activities in, and relevant to, user education.* (BNC: 191 B3D)
 [to be responsible for... = plan, appropriateness, or necessity?]

To summarise, as examples of (9a'), (10a'), (11a'), and (12a') clearly indicate, the shades of meaning expressed by an NIRC essentially parallel those of the IS TO construction. In order to better understand the nature of the NIRCs, I will now examine the possible syntactic variants of this construction.

4. NIRCs and grammatical voice

As we have seen in section 1, Nagahara (1990: 62-3) contends that the antecedent of an NIRC seems to be restricted to the subject of a passivised *to*-infinitive (i.e. a passivised NIRC). However, a close look at corpus data reveals that this hypothesis does not always hold. Out of 223 examples of NIRCs in my corpus data, 12 examples are of the active voice *to*-infinitive construction. Out of these, seven were from a list of appointments in a British newspaper (*The Independent*). Some of the examples are:

- (15) a. Maj-Gen Sir Christopher Airy, *to be Private Secretary to The Prince and Princess of Wales*, in succession to Sir John Riddell.
 b. Mr BGJ Canty, *to be Governor of Anguilla*, in succession to Mr Go Whittaker.
 c. Admiral Sir Derek Reffell, *to be Governor and Commander-in-Chief, Gibraltar*, in succession to Air Chief-Marshal Sir Peter Terry. (BNC: A1H 18-20)

Furthermore, there are some more examples of active voice NIRCs which are not connected with appointments:

- (16) a. The folds meet and fuse forming a broad tube, the neural tube, that will be the brain, with a narrower tube, *to be the spinal cord*, behind it. (BNC: ASL 234)

a'. = ..., which is to be the spinal cord, behind it.

- b. Most university libraries in Britain have appointed to their staffs some subject specialists, with qualifications in a subject as well as in librarianship, *to be responsible for book selection and reference and information work (and sometimes other activities) within their specialisation*. (BNC: B07 1496)

b'. = ..., who are to be responsible for book selection...

- c. Poland's parliament is already drafting one, *to be ready, it is hoped, by mid-1991*. (BNC: ABF 2946)

c'. = ..., which is to be ready...

On the basis of my corpus survey, it is quite reasonable to state that an NIRC does not always have to be passivised. In this respect Nagahara's (1990: 62-63) claim that the antecedent of an NIRC is always restricted to the subject of a passive infinitive is demonstrably incorrect. Rather, in agreement with Quirk *et al.*'s and Huddleston's explanations, I would say that the antecedent of an NIRC is most likely to be the subject of *to*-infinitives of either the active or passive construction.⁸

The corpus examples we have seen are restricted to a syntactic pattern of infinitival *to* + *be*-verbs, on the basis of previous analyses. However, other intransitive and transitive verbs can sometimes be used in NIRC, as in:

- (17) a. The place of Chatsworth, *shortly to belong to Prince Charles as the heir to the throne*, is now undergoing renovation.

⁸ As we have seen in (6a) in section 2, the antecedent of NIRC can also be the object of *to*-infinitives of the active voice in the form of "*for* + NP + *to*-infinitive". The frequency of this type is very low, however.

- b. Prince Siyank, *shortly to own the largest palace in Indochina*, is looking for an architect to work on the renovation of his new property.⁹

The acceptability of (17a) and (17b) seems to be supported by the existence of the adverb *shortly*, by which the shades of meaning ‘plan’ is emphasised in the infinitival clause.

5. Processing mechanisms by which infinitival clauses are parsed as the NIRC

Although we have seen that an NIRC can take both active and passive constructions, this still leaves us with the question of why the following example in (18) is unacceptable.

- (18) *This scholar, *to find daily in the British Museum*, has devoted his life to the history of science. (= (3))

For the explication of this problem, I propose that the notion of ‘information processing’ will be a crucial factor. Here I would like to pay attention to two linguistic facts: (i) the infinitival clause in (18) is set off from its antecedent by punctuation. In other words, this clause forms an information unit separated from its antecedent. And (ii) the clause *to find daily in the British Museum* has both a notional subject (PRO) and a notional object (*t_i*) as in:

- (19) *This scholar_i, PRO *to find t_i daily in the British Museum*, has devoted his life to the history of science.

This explanation seems to be concerned with a comparison of the following sentences.

⁹ (17a) and (17b) are not from corpus data, but are given by Prof. Geoffrey Leech at Lancaster University (p.c.).

(20) a. We took the earliest train, which was to arrive in London by midday.

b. We took the earliest train, to arrive in London by midday.

(20b) is a sentence in which the relativiser *which* and the *be*-verb *was* are deleted from (20a), and was created for the sake of comparison between the finite relative clause and the infinitival clause. As (20b) shows, the infinitival clause *to arrive in London by midday* is highly likely to be recognised as being an adverbial purposive clause. This is because *to arrive* generally has an implication of voluntary intention to achieve a particular purpose or goal, and there is a causal relationship between the situations denoted by the main clause and the infinitival clause of (20b) (c.f. Bach 1982: 53). We should notice here that unlike (19), (20b) requires the hearer to interpret the single notional category (i.e. PRO of *to arrive*). To support this, let me give a similar example:

(21) a. Jackson, *who is to give two sell-out concerts at the gigantic Fukuoka Dome on Friday and Saturday*, left town almost as fast as he entered it. (BNC: K2L 144)

b. Jackson, *to give two sell-out concerts at the gigantic Fukuoka Dome on Friday and Saturday*, left town almost as fast as he entered it.

(21b) permits only the purposive adverbial interpretation. It seems to me that the impossibility of interpreting (21b) as an NIRC is caused by two factors. Firstly, the *to*-infinitive in (21b) (i.e. *to give*) has an implication of ‘agent’s voluntary action in the future’. Secondly, there is no relativiser and a clear causality between the situations denoted by the main and *to*-infinitival clauses. These two factors tempt the hearer to parse the infinitive clause not as a relative clause but as an adverbial clause. Furthermore, the infinitival clause (*to give*) in (21b) has only its notional subject (*Jackson*) to be interpreted, of which processing effort will be reasonably adequate.

I would like to put forward a processing mechanism by which *to*-infinitival clauses which form a single information unit separated from their antecedent prosodically or by comma are parsed. This processing mechanism is depicted in Figure 3.

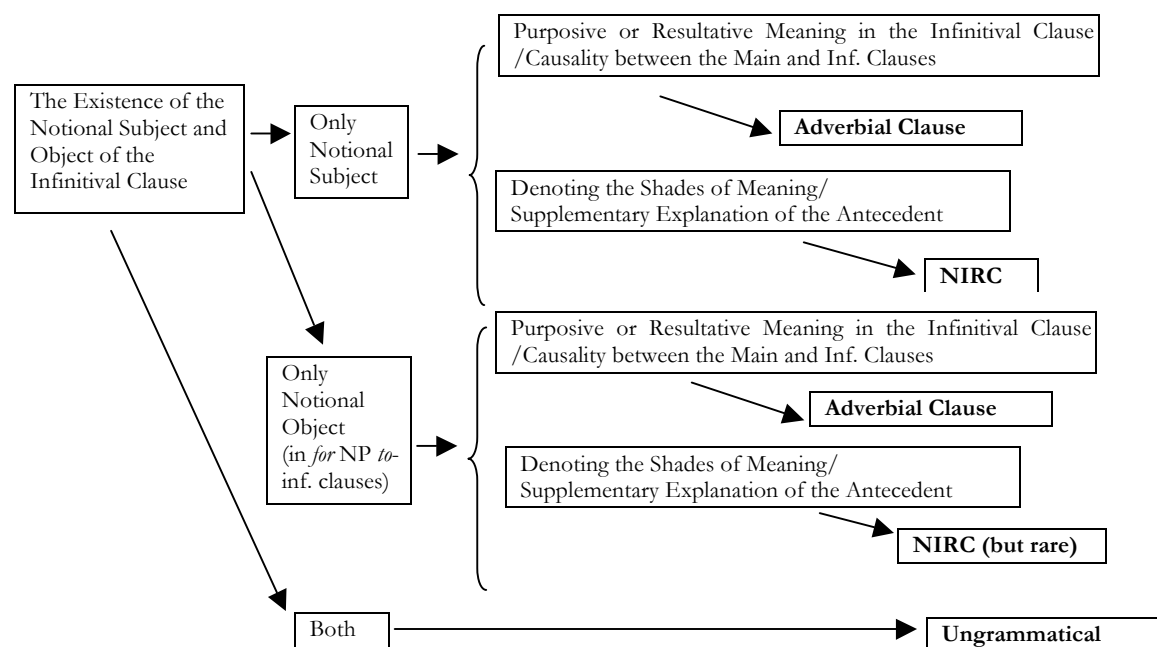


Figure 3. A processing mechanism in which *to*-infinitival clauses which form a single information unit separated from their antecedent prosodically or by comma are parsed, above.

Figure 3 can be explained as follows. Firstly, we will start to parse ‘an infinitival clause separated from its antecedent prosodically or by comma’ by interpreting its notional subject and object. If the infinitival clause does not have its overt “*for* NP subject” and has only one notional category, the category is highly likely to be the notional subject (e.g. (20b) and (21b)).¹⁰ Then we will examine the semantic relationship between the main clause and the infinitival clause of the sentence. If the situations denoted by these clauses have a clear causal relationship, the infinitival clause should be parsed as an adverbial purposive clause. When the clauses have no clear causal relationship between them but the infinitival clause has one of the four shades of meaning discussed in section 2 and functions as a supplementary explanation of the antecedent noun, the infinitival clause will be parsed as an NIRC (e.g. (2)). Secondly, if the infinitival clause consists of ‘*for* NP

¹⁰ In this respect Huddleston’s analysis proves to be reasonable, but his analysis lacks the consideration of the *for* NP + *to*-infinitive construction and the semantic property of NIRCs.

+ *to*-infinitive’ and is separated from its antecedent, the notional category is necessarily an object of the clause. On condition that there is a clear causality between the infinitival clause and the main clause of the sentence, the infinitival clause should be parsed as an adverbial purposive clause (e.g. (7a)). On the other hand, when there is no clear causality between the main and the infinitival clauses in the sentence, but one of the shades of meaning can be found in the infinitival clause, the clause could be parsed as an NIRC (e.g. (6a)). The frequency of this type, however, proved to be very rare on the basis of my corpus survey. Thirdly, if the *to*-infinitive clause which forms a single information unit has both notional subject and object, in other words two notional categories, it is most likely to be ungrammatical.

Here, the validity of the parsing mechanism depicted in 3 should be examined. First, let us examine the processing mechanism by which sentence (20b) above is parsed (i.e. *We took the earliest train, to arrive in London by midday*). The infinitival clause of this sentence is preceded by a comma and then this parsing mechanism is applicable. We will start to parse this infinitival clause by construing the notional subject and object of the infinitive. In this sentence, we only have to think about the notional subject of the *to*-infinitive, which requires us a moderate processing effort. And then, we will find there is a clear causal relationship between the situations denoted by the main and the infinitival clauses. Therefore, this infinitive clause will be parsed as an adverbial purposive clause.

In sentence (2) (i.e. *This scholar, to be found daily in the British Museum, has devoted his life to the history of science*), the infinitival clause is also preceded by a comma and forms a single information unit separated from its antecedent. This infinitival clause requires us to process its notional subject, and this processing effort will be reasonably adequate. And although there is no causality between the situations denoted by the infinitival clause and the main clause, the infinitival clause expresses “possibility”, one of the shades of meaning denoted by the NIRC, and functions as a supplementary explanation of the antecedent (i.e. *This scholar*). Using this processing mechanism, the infinitival clause will be reasonably parsed as an NIRC.

The processing mechanism depicted in Figure 3 is necessary for examining “*for* NP + infinitival clauses”, in which the notional category of the *to*-infinitive is

inevitably an object of the clause. In sentence (7a) (i.e. *In one method, the recordings give dialogues, without pauses, for learners to study and imitate*), the infinitival clause “for learners to study and imitate” is preceded by a comma and forms a single information unit. As this infinitival clause requires the hearer to interpret a single notional category (i.e. the object of the *to*-infinitive), only a moderate processing effort is needed. Semantically, the situation denoted by *for learners to study and imitate* functions as a “purpose” for the situation expressed by the main clause. Therefore, this infinitival clause will be parsed as an adverbial purposive clause.

The processing mechanism in Figure 3 can also be applicable to sentence (6a) (i.e. *Peace and tranquillity reign in the well-kept grounds, which offer numerous tables and chairs in pleasant shady corners, for guests to relax in*). *For guests to relax in* forms a single information unit and has only one notional category to be interpreted (i.e. the notional object of *to relax in*). There seems to be a causality between the main and the infinitival clauses of the sentence, but at the same time *to relax in* has an implication of possibility, one of the shades of meaning and this infinitival clause functions as a supplementary explanation of the antecedent (i.e. *pleasant shady corners*). The antecedent noun *pleasant shady corners* will be relativised as the object of the infinitival clause, and thus *for guests to relax in* can be paraphrased by “in which guests can relax”.¹¹ This is the reason why this infinitival clause is parsed as an NIRC.¹²

The ungrammaticality of example (18) can be explained by Figure 3 (i.e. **This scholar, to find daily in the British Museum, has devoted his life to the history of science*). The infinitival clause is preceded by a comma and forms one information unit separated from the main clause. And this infinitival clause requires the hearer to interpret both its notional subject (i.e. PRO) and notional object (i.e. *this scholar*) within this single information unit almost at the same time. This will give rise to

¹¹ As I stated in the footnote 3 in section 2, the difference between NIRCs and infinitival adverbial clauses may be a matter of degree rather than discrete categories.

¹² This analysis may give rise to a question about the acceptability of (4c) (i.e. *This room, for you to teach algebra in*, adjoins mine), which my participants do not find to be acceptable, although Emonds (1979) accepts it. The difference in the acceptability between (4c) and (6a) is likely to lie in the location of the infinitival clause. The infinitival clause in (4c) modifies the sentence subject, while the clause *for guests to relax in* modifies the noun phrase in the predicate. According to Carroll (1999:292) a relative clause which modifies the sentence subject may be more difficult to interpret than one which modifies the sentence object, because of processing limitations.

inadequately large processing difficulty. Furthermore, there is no causality between the situations denoted by the infinitival clause and the main clause. And this clause is unlikely to have the shades of meaning denoted by NIRC. These inadequate processing difficulties and the illogicality of the sentence will lead to ungrammaticality.

To enhance our understanding of the parsing mechanism, I will apply it to the examples given by Emonds (1972). In Emonds's example (4a) (i.e. **Mary and John, (for someone like you) to teach algebra to, are now coming downstairs*), the infinitival clause forms a single information unit separated from the antecedent and requires us to interpret both its notional subject and object within this unit. And the sentence subject 'Mary and John' might be possibly interpreted as the notional subject of the infinitive at first, but this infinitive clause also requires us to interpret its notional object. This will lead to inadequately large processing effort to understand this sentence. Therefore this sentence will be judged as ungrammatical.

We will direct attention to Emonds's example (4c) (i.e. *The girls (for someone like you) to teach algebra to are now coming downstairs*). In this example, the infinitival clause is restrictive and forms an information unit combined with the antecedent noun. And thus the parsing mechanism I put forward is not applicable here. Furthermore, the sentence subject 'the girls' will be definitely interpreted as the notional object of the infinitive clause, given that the preposition *to* follows *to teach algebra*.

The processing mechanism in Fig. 3 can also be applicable to examining Emonds's example (4d) (i.e. *? This room, to teach algebra in, adjoins mine*). The infinitival clause is separated from its antecedent and requires us to interpret both notional subject and object of the clause. Furthermore, there is no causality between the situations referred to by the infinitival clause and the main clause. According to my participants (i.e. native-speakers of English), this sentence must be interpreted as ungrammatical rather than questionable. We might here need to discuss the reason why Emonds judged this sentence as questionable rather than ungrammatical. The sentence subject (i.e. *this room*) is easily interpreted as the notional object of *to teach algebra in* on the basis of the meaning of 'this room.' This semantic relationship might have influenced Emonds's judgement of this sentence as 'questionable' rather than 'ungrammatical'.

6. Conclusion

The main purposes of this paper have been twofold. The first purpose was to describe semantic properties of NIRC_s on the basis of corpus data. My corpus-based approach clarified that the shades of meaning expressed by this construction were similar to ones represented by the IS TO construction: plan, necessity/appropriateness, future in the past, and possibility.

The second purpose of this paper was to come up with a valid specification of the restrictions which apply to the use of NIRC_s. Regarding the voice of the NIRC, there is a strong tendency for this construction to occur in the passive voice, although there are some apparent exceptions in which it occurs in the active voice (see section 3). The corpus evidence adduced here makes it reasonable to posit, however, that NIRC_s in the active voice are confined to a limited pattern: they are highly likely to consist of *to be* + noun (e.g. (13a-c)/adjective (e.g. (14b-c)).

As with the restriction on the use of NIRC_s, I put forward a processing mechanism by which the infinitival clauses which form a single information unit separated from their antecedent prosodically or by comma are parsed as the NIRC. I have shown that infinitival clauses preceded by a comma or pause are parsed as NIRC_s when they have one empty category, which is highly likely to be a notional subject of the infinitive, and they denote one of the shades of meaning rather than causality and functions as a supplementary explanation of the antecedent. As with the *for* NP + *to*-infinitive construction, this construction can be parsed as a NIRC but its frequency proved to be very low. To verify the validity of this hypothesis more conclusively, however, we have to await further research.

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