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Упорядочение простых предложений в составе сложного предложения в английском языке¹

В статье вводится ряд лингвистических понятий, необходимых для моделирования линейного порядка простых предложений (клауз) в составе сложного предложения английского языка: простое предложение, сложное предложение, семантические и синтаксические тема, рема и спецификатор, синтаксическая и коммуникативная автономность простых предложений. Поверхностно-синтаксическая структура (интерпретируемая в терминах зависимостей) и синтактико-коммуникативная маркировка сложного предложения служат входом для правил упорядочения простых предложений. Предлагаются и иллюстрируются правила перехода от поверхностно-синтаксической и коммуникативной структур сложного предложения к его линейной структуре.

Ключевые слова: английский синтаксис, синтаксические зависимости, коммуникативная структура и порядок слов, простое предложение, сложное предложение.

1. The problem stated

The present paper aims at describing the synthesis (= production) of complex sentences in English from the viewpoint of word order, with an eye to possible generalization to other languages. We consider the transition from

¹ The first version of this paper was read and criticized by B. Bohnet, A. Burga and L. Wanner; the remarks by Burga lead to a substantive revision of the text. The next version underwent the scrutiny of M. Alonso Ramos, I. Boguslavskij, A. Burga, S. Kahane, J. Milićević and A. Polguère; D. Beck took a serious look at the paper and eradicated several clumsy formulations and outright mistakes. Finally, objections and suggestions from J. Rooryck and A. Zimmerling allowed us to introduce additional corrections and make the paper more readable.

We are happy to express our most heartfelt gratitude to all these colleagues and friends.

the meaning of a complex sentence through its syntactic and syntactic-communicative structures to the sentence itself, concentrating on just one aspect – the linear ordering of simple clauses within a complex sentence. Our goal is to propose sentence-synthesis rules determining the order of clauses:

$$\begin{array}{ccc} \text{complex sentence} & \text{ordering} & \text{linearized} \\ & \text{rules} & \text{complex sentence} \\ \{\text{syntactic \& communicative structures}\} & \Leftrightarrow & \{\text{clause}_1 + \text{clause}_2 + \dots + \text{clause}_n\} \end{array}$$

As strange as this may seem, there is not much literature on clause ordering in English complex sentences, and there is, as far as we know, no work aimed at specifying clause-ordering rules.¹ We are breaking virtually new ground; therefore, we need to introduce several notions and formalisms.

Since we deal with meaning-to-text type rules, this study has been carried out within the Meaning-Text framework.² However, in order to facilitate the reading, we do our best not to be too theory-specific and we define or, at least, informally explain all the notions that we use.

Meaning-Text synthesis rules are organized into six modules:

- | | | | |
|------------------------|-----------|---|-----------|
| 1. Semantics: | {SemR} | ⇔ | {DSyntR} |
| 2. Deep syntax: | {DSyntR} | ⇔ | {SSyntR} |
| 3. Surface syntax: | {SSyntR} | ⇔ | {DMorphR} |
| 4. Deep morphology: | {DMorphR} | ⇔ | {SMorphR} |
| 5. Surface morphology: | {SMorphR} | ⇔ | {DPhonR} |
| 6. Phonology: | {DPhonR} | ⇔ | {SPhonR} |

¹ The literature on the question

For the queries “clause ordering in English” and “order of clauses in English,” the Google search returns merely a couple dozen hits. And most of the references found (curiously, almost all of them by foreign scholars) deal with morphological techniques of marking the semantic dependency relations between clauses and describe the tendencies observed in texts. Thus, they note that subordinate clauses with such and such a conjunction or of a given length tend to precede/follow its governing clause. True, several interesting observations have been made, such as the preference for iconicity, which makes that a temporal clause describing a previous event tends to precede its governing clause talking about the following event [4]. However, this result, no matter how interesting in itself, is irrelevant for clause ordering: the semantic considerations playing out in iconicity concern the construction of the communicative structure of the sentence, not directly the linear arrangement of clauses. Lee [9] explicitly speaks about the role of communicative structure in clause ordering, but only so far as the positioning of an IF-clause is involved: it precedes in case it expresses the Theme. The only text addressing clause ordering in English is, to the best of our knowledge, the book [1, p. 1037ff]. – For Russian, we should mention the pioneering work of E. Padučeva [19].

² The Meaning-Text approach has been presented in a number of publications, most recently – [12, p. 102ff]; for more specific details on communicative structure and syntax in this framework one can consult [10; 13; 14].

³ Here, -R stands for “representation,” the curly brackets { } enclose sets, and ⇔ means “corresponds”. The abbreviations D- and S- refer to deep and surface sublevels of representation,

The fact crucial for the understanding of the subsequent discussion is that we work with syntactic structures written in terms of **syntactic dependencies** rather than in terms of (more familiar to many) phrase-structure formalism (see, for example, [11]). Note that throughout this paper a dependency is shown with an arrow: $A \leftarrow B$ means ‘A depends on B’.

The synthesis of a complex sentence is understood here as linear ordering of simple clauses within this sentence, plus prosodization and morphologization of the string of clauses thus obtained, with the necessary mutual adjustment of the clauses being united.¹ (The notions of clause and sentence are defined in 2.1).

A simple clause is synthesized out of the lexical units that compose it; they are linked by syntactic dependencies and form a syntactic structure supplied with a communicative structure. Analogously, a complex sentence is synthesized out of the simple clauses that compose it – according to the syntactic links between them and their communicative characteristics. These are two mutually independent linguistic operations, which must be described separately. In what follows, the former – the synthesis of a simple clause – is taken

respectively; Sem-, Synt-, Morph- and Phon- stand for “semantic”, “syntactic”, “morphological”, and “phonic”. Thus, semantics, or the semantic module of a language, establishes correspondences between the set of semantic representations {SemR} of sentences and the set of deep-syntactic representations {DSyntR} of sentences, and so forth.

¹ Mutual adjustment of clauses within a complex sentence

When two simple clauses synthesized in isolation are combined within a complex sentence, the following three types of modification of the clauses being combined have to be foreseen (depending, of course, on the language):

1. Lexical modifications, such as, for instance, adding the lexeme *THEN* at the beginning of the superordinate clause (= apodosis) of a conditional complex sentence that expresses a logical implication, if the subordinate clause (= protasis) precedes:

(i) The two starting clauses are (a) *emigration will stop* and (b) *if the quality of life goes up*. In case the clause (b) precedes, we can have *If the quality of life goes up, then emigration will stop*.

2. Morphological modifications, such as, for instance, adding a special marker to the noun modified by a relative clause:

(ii) Persian

The two starting clauses are (a) *ketab inžast* lit. ‘book here.is’ and (b) *ki anra mixanām* lit. ‘that it_{DirO} I.am.reading’. The clause (b) is a relative depending on the noun *KETAB* ‘book’. When the two clauses are put together, this noun must – except for some particular cases – take the suffix *-i*:

Ketab + i ki anra mixanām inžast ‘The/A book that I am reading is here’.

3. Prosodic modifications, such as, for instance, changing the final prosody of a stand-alone clause to a continuation prosody in case this clause precedes another clause within the sentence:

(iii) The two starting clauses are

(a) *emigration will stop* and (b) *if the quality of life goes up*.

In case the clause (a) precedes, we have

Emigration will stop | if the quality of life goes up.

for granted; we deal only with the latter – the synthesis of a complex sentence; a synthesized simple clause is manipulated as a block.

This paper only presents **some** rules of Module 3 (that is, of surface syntax) of a linguistic Meaning-Text model – namely, the rules of the {SSyntR} ⇔ {DMorphR} transition responsible for the ordering of simple clauses within a complex sentence. To formulate these rules, we need the notions of dependent, or subordinate, clause [SubC], and governing, or superordinate, clause [SuperC].¹ For simplicity's sake, we will say that a SubC syntactically depends on its SuperC, meaning that it is the SubC's syntactic head that syntactically depends on a lexeme in its SuperC. (The head of a SubC is either a subordinate conjunction, if it is present, or the finite verb, if there is no conjunction, as, for instance, in a relative clause.)

We operate from the following premise:

|| Just as with the ordering of wordforms within a simple clause [15], the ordering of clauses within a complex sentence can be described in accordance with direct syntactic dependencies between clauses: roughly speaking, it can be reduced to the linear placement of a subordinate clause with respect to its superordinate clause.

In English, a SubC can precede or follow its SuperC or be placed inside it; a SubC cannot include its SuperC. Therefore, the following three linear arrangements of two syntactically linked clauses are possible: **SubC** + SuperC, SuperC + **SubC**, and SuperC- + **SubC** + -SuperC (a SubC is “inserted” into its SuperC). For instance:

- (1) a. ***When war broke out**, the stock market went up.*
 b. *The stock market went up **when war broke out**.*
 c. *The stock market, **when war broke out**, went up.*

Considered in isolation, the complex sentence illustrated in (1) allows all three theoretically possible arrangements of its two clauses. However, within an actual text, this is not necessarily the case: some clause arrangements in a given complex sentence can be constrained by the previous context. Thus, arrangements (1b-c) are inappropriate if they follow the sentence *1941 saw the Japanese attack on Pearl Harbor* (the symbol “*w^oX” means that the sequence X is bad because of **w**ord **o**rd^er):²

¹ Following [1], we prefer the terms *superordinate* vs. *subordinate* (clause) to the more current terms *main* vs. *subordinate*. The term *main* is not relational: it characterizes the properties of a clause rather than its relationship to another clause. Thus, clause C₂ being subordinate to clause C₁ can itself have its own subordinate C₃; however, C₂ is not a main clause.

² As for arrangement (1a), it seems to be possible in any context; for instance:

(i) *1941 saw the Japanese attack on Pearl Harbor. **When war broke out**, the stock market went up.*

- (2) b'. 1941 saw the Japanese attack on Pearl Harbor. *^{w0}The stock market went up **when war broke out**.
 c'. 1941 saw the Japanese attack on Pearl Harbor. *^{w0}The stock market, **when war broke out**, went up.

These complications of the linear disposition of clauses are related to the communicative structure [CommS], a.k.a. *Information Structure*, of the sentence, so that the latter will be paid special attention. The CommS of a sentence to be synthesized is established by the Speaker – as a function of his intentions and of the preceding context – in order to make the text coherent and understandable.¹ Our task in this paper is, as already said, to formulate the rules that, based on the syntactic structure and the syntactic-communicative structure of a complex sentence, determine the linear order of the clauses within it.

The paper is organized as follows: after defining some necessary notions – syntactic (2) and communicative (3) – and considering syntactic *vs.* thematic division of a complex sentence (4), the rules for clause ordering are presented (5), and their application is illustrated (6); finally, some conclusions are formulated (7).

Our starting data are a few hundred English sentences from the Penn Tree-Bank annotated by Alicia Burga and Leo Wanner with partial Comm-structures – namely, specifying Thematic areas (Rheme ~ Theme ~ Specifiers; for the details of this annotation, see [2]). We have added to it more examples, borrowed from actual texts or supplied by ourselves in order to illustrate different possibilities.

In the examples of syntactic and communicative structures, we use shortcuts: elements immaterial for the discussion (such as some grammemes or some labels of surface-syntactic relations) are not shown, certain syntactic nodes are grouped together, internal communicative divisions of certain communicative areas are not specified where irrelevant, etc.

(ii) *Share value has the tendency to strongly fluctuate. When war broke out, the stock market went up.*

This is so because a temporal subordinate clause can always be interpreted as a Comm-Specifier, see below, 3.2.1.

¹ Let us emphasize that computing the Comm-structure of the sentence under synthesis (by the Speaker or by a linguistic model) is a separate task, which we do not consider here. It has to be accomplished **before** the rules of meaning-to-text transition apply – namely, on the stage of text planning, which ensures the coherence and natural character of the text (see, for instance, [6, p. 283–286]). In the present paper, the Synt-Comm-structure of a sentence is taken for granted. – “The Speaker” (with a capital “S”) stands for ‘the author of this speech act’ – that is, ‘I’; *speaker* (with a lowercase “s”) refers to any speaker of a language.

2. Necessary syntactic notions

2.1. Simple clause and complex sentence

Simple clause

L stands for “a given lexical unit.”

A simple clause is a phrase such that it satisfies simultaneously the following two conditions:

- 1) It is headed either by a V_{FIN} (= a finite verb), or a $CONJ_{(subord)}$ -**subord-conjunct**→ V_{FIN} (= subordinate conjunction with its dependent V_{FIN}) or a $PREP$ -**prepositional**→ V_{FIN} (= preposition with its dependent V_{FIN}),¹ this V_{FIN} having the subject L (V_{FIN} -**subjectival**→L);
- 2) It contains all the direct and indirect dependents of the above configurations, except another configuration « $(CONJ'_{(subord)}/PREP'→) V'_{FIN}$ -**subjectival**→L'».

In prose, a simple clause is defined by the unique subjectival syntactic dependency; the constraint “does not contain another configuration « $(CONJ_{(subord)}/PREP→) V'_{FIN}$ -**subjectival**→L' ...»” ensures this uniqueness, while allowing for conjoined V_{FIN} s that share the same subject (*John reads a paper and drinks coffee* is a simple clause). For instance (the borders of simple clauses are shown by curly brackets):

- (3) a. {*The stock market*←**subj**→*went* $_{V_{FIN}^1}$ *up*.} $_{CLAUSE_1}$
- ┌ **subord-conjunct** ─┐
 {*when* $_{CONJ}$ *war* ←**subj**→*broke* $_{V_{FIN}^2}$ *out in 1941*.} $_{CLAUSE_2}$
 └──────────────────┘
 └──────────────────┘ **subj** ───────────────────┘
- b. {*The shares* {*we* ←**subj**→*had* $_{V_{FIN}^2}$ *bought*} $_{CLAUSE_2}$ *went* $_{V_{FIN}^1}$ *up*.} $_{CLAUSE_1}$
- c. {*He*←**subj**→*won*'t $_{V_{FIN}^1}$ *apologize* –
 ┌ **prepositional** ─┐
 {→*for what he*←**subj**→*said* $_{V_{FIN}^2}$ } $_{CLAUSE_2}$ } $_{CLAUSE_1}$

Such “incomplete” phrases as *McGuire declared* [*that the stock market had gone up*] or [*What we found*] *proved important* are treated as simple clauses; this corresponds to the traditional approach.

The proposed definition of a simple clause is valid for languages in which a clause necessarily contains a finite verb. To generalize it to all languages, the reference to V_{FIN} must be replaced with a detailed description of possible syntactic heads that, along with a V_{FIN} , accept a subject (predicative adjectives

¹ This is a so-called headless relative clause introduced by a preposition, such as *from where he was standing* or *on what she said*. These clauses will be discussed in connection with the rule that describes them; see 5.2.4, rule 9, p. 45.

in Japanese and Korean, predicative forms of nominal lexemes in Turkic languages, etc.).

A complex clause can be defined as a set of syntactically linked simple clauses. However, the distinction between a simple and a complex clause can be ignored in the present study, so that we will omit the adjective *simple* and speak simply of clauses.

Along with genuine clauses, English has what can be called *quasi-clauses*. A quasi-clause is one of (at least) the following regular reductions of a genuine clause:

- an absolute construction with or without a preposition, see (4);
 - a participial construction with a subordinate conjunction, see (5);
 - an infinitive construction with an interrogative-relative pronoun, see (6).
- (4) a. {*Sixty percent of the fund will be invested in stocks,*}_{CLAUSE₁}
 {*with the rest going into bonds.*}_{CLAUSE₂}
- b. {*The government abolishes its golden share in Jaguar,*}_{CLAUSE₁}
 {*the luxury auto maker being stalked by General Motors.*}_{CLAUSE₂}
- (5) {*When offering \$1,250 to retired major leaguers,*}_{CLAUSE₁}
 {*they lost the chance of another season.*}_{CLAUSE₂}
- (6) {*Everybody knows*}_{CLAUSE₁} {*whom to blame.*}_{CLAUSE₂}

Since quasi-clauses behave in many respects like genuine clauses, they are considered, by analogy, to be a subset of clauses; however, they feature a number of particularities, and for the moment, our clause-ordering rules do not cover them.

Now let us switch to sentences. A sentence is an utterance that constitutes a stand-alone communicative unit; it may be or not be a clause – just as a clause may be or not be a sentence: for instance, “nominative” sentences (*London. November. A rainy night. Empty streets.*) and exclamatory sentences of a special type (*What a horrible weather!*) are not clauses; subordinate clauses are not sentences. If a sentence contains just one clause it is called a simple sentence; otherwise, it is a multiclausal sentence. Multiclausal sentences are either compound sentences, which consist of coordinated clauses (CLAUSE₁–**coord**→CLAUSE₂), or complex sentences, which are our target here.

Complex sentence

|| A sentence is a complex sentence if and only if it consists of at least two simple clauses one of which is syntactically subordinated to the other:
 || CLAUSE₁–**subord**→CLAUSE₂.

Here, CLAUSE₁ is a superordinate clause [SuperC] for CLAUSE₂, and CLAUSE₂ its subordinate clause [SubC]. The top node of a SubC depends on a lexeme in its SuperC by a non-coordinate relation:

- (7) a. $\left\{ \text{The stock market } \textit{went up significantly}, \right\}_{\text{CLAUSE}_1} \left\{ \textit{when war broke out in 1941.} \right\}_{\text{CLAUSE}_2}$ ← **circumstantial** →
- b. $\left\{ \textit{The shares} \left\{ \textit{we had bought in 1941.} \right\}_{\text{CLAUSE}_2} \right\}_{\text{CLAUSE}_1} \left\{ \textit{went up significantly.} \right\}_{\text{CLAUSE}_1}$ ← **relative** →

The notions of “superordinate clause” and “subordinate clause,” as was stated above, are relational: “superordinate” means ‘syntactic governor’, and “subordinate” means ‘syntactic dependent’ in a given pair of syntactically linked clauses; a CLAUSE_i can be superordinate with regard to CLAUSE_j , being, at the same time, subordinate with regard to CLAUSE_k .

A complex sentence can contain any number of syntactically linked clauses; for instance, sentence (8) contains five simple clauses, whose syntactic links are shown in Figure 1 (clauses are numbered in linear order; a clause is identified by a subscripted circled number):

- (8) $\textcircled{1} \left\{ \textit{But McGuire said} \right\}_{\textcircled{1}}$
 $\textcircled{2} \left\{ \textit{that}, \left\{ \textit{while the S.E.C. regulates} \right\}_{\textcircled{3}} \left\{ \textit{who files}, \right\}_{\textcircled{4}} \textit{the law tells them} \right\}_{\textcircled{2}}$
 $\textcircled{5} \left\{ \textit{when they can do so.} \right\}_{\textcircled{5}}$

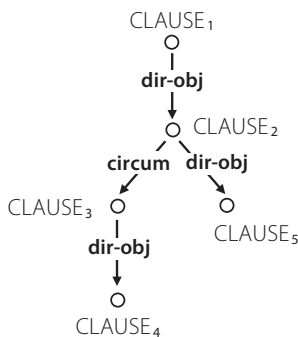


Fig. 1. A simplified syntactic structure of sentence (8)

2.2. Syntactic autonomy of subordinate clauses

The linear position of a SubC with respect to its SuperC is linked to an important property of the SubC: its syntactic autonomy/non-autonomy. These two syntactic types of subordinate clauses were introduced in [18, p. 466: *neprislovnye pridatočnye* (= our autonomous subordinate clauses)], whose linear position is established with respect to the whole superordinate clause, and *prislovnye pridatočnye* (= our non-autonomous subordinated clauses), positioned with respect to a word inside the superordinate clause.

Syntactically autonomous/non-autonomous subordinate clause

- A SubC is syntactically autonomous if and only if:
- 1) it is headed by a semantically full subordinate conjunction or its constructional equivalent;¹
 - 2) it syntactically depends on the Main Verb of its SuperC.
- Otherwise, a SubC is syntactically non-autonomous.

Thus, in (9a) the circumstantial SubC is syntactically autonomous, while the SubC in (9b–d) is not: in (9b), the SubC does not have a conjunction; in (9c), the conjunction is semantically empty; and in (9d), the SubC introduced by a full conjunction (SINCE) depends not on the Main Verb, but on an infinitive (DO):

- (9) a. *When war started, John left.*
 b. *The war that had started this year lasted several weeks.*
 c. *He said that the war had started.*
 d. *The agreement to do this, since it seemed right to all, was reached almost instantly.*

The difference between syntactically autonomous and non-autonomous SubCs is relevant for the linear placement of a SubC:

- A syntactically autonomous SubC is linearly placed under the control of the syntactic-thematic structure of the complex sentence (see 3).
 A syntactically non-autonomous SubC is placed in accordance with the surface-syntactic relation that links it to its governor. The communicative information is much less relevant and plays mainly in colloquial language; in our rules, it is not accounted for.

¹ Semantically full conjunctions

A semantically full conjunction carries meaning; it has its source in the semantic structure of the sentence. A semantically empty conjunction has no meaning and has no source in the semantic structure; it is introduced into the surface-syntactic structure of the sentence by a surface-syntactic rule (e.g., THAT in *John knows that I am in town.* or AS in *The market, as the press release states, is in turmoil.*).

The meaning corresponding to a semantically full conjunction can be expressed by a meaningful syntactic construction – for instance, the irrealis construction seen in the sentence *Had he told the truth, he would be in a better position now.* Technically, such a construction is represented in the deep-syntactic structure by a fictitious lexeme – a subordinate conjunction «IF_{irr}», which gives rise, in the surface-syntactic structure, to the construction itself. In the present paper, we do not consider this type of construction.

Some semantically full subordinate conjunctions have homophones of three types that appear exclusively in syntactically non-autonomous SubCs:

- Semantically empty conjunctions, which are automatic complementizers: for instance, IF_H in sentences such as *John asked me if I had already met Mary.*
- Semantically empty pronominal relators: for instance, WHEN_{H.1} in sentences such as *The day when I arrived in Montreal was cold, but sunny.*
- Semantically full relative-interrogative adverbs: for instance, WHEN_{H.2} in sentences such as *Everybody knows when I arrived in Paris.*

2.2.1. Syntactically autonomous subordinate clauses

At the semantic level, the meaning of a future Synt-autonomous SubC is linked to the meaning of its SuperC through a semantic configuration ‘ $\tilde{\sigma}$ ’ that takes the meanings of both clauses as its Sem-actants, the meaning of the SuperC being its SemA 1: ‘SubC’ $\leftarrow 2$ –‘ $\tilde{\sigma}$ ’– $1 \rightarrow$ ‘SuperC’. At the syntactic level, the configuration ‘ $\tilde{\sigma}$ ’ can be expressed by a subordinate conjunction, which heads the SubC; this is the case that interests us in this paper. The conjunction in question is subordinated to the Main Verb of the SuperC by the **circumstantial** SSynt-relation. In the SSynt-structure, an autonomous SubC can be only circumstantial. (The more fine-grained classification of circumstantial SubCs accepted in traditional grammar – temporal, causal, conditional, concessive, etc. clauses – is taken care of by addressing, when needed under synthesis, the meaning of the subordinate conjunction.)

Sentence (10) has the semantic structure shown in Figure 2 and the surface-syntactic structure shown in Figure 3.

(10) *The shares went up when the war broke out.*

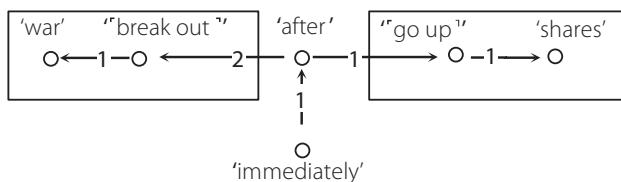


Fig. 2. A simplified semantic structure of sentence (10)

The semantic configurations corresponding to the SubC and the SuperC are boxed in the diagram; they are linked by the configuration of semantemes ‘ $\tilde{\sigma}$ ’ = ‘immediately after’, which is the source of the semantically full subordinate conjunction *WHENI.3* (the lexicographic number is borrowed from *LDOCE Online*).

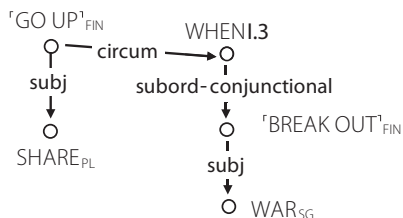


Fig. 3. A simplified surface-syntactic structure of sentence (10)

2.2.2. Syntactically non-autonomous subordinate clauses

As indicated in the definition of syntactic autonomy, a non-autonomous SubC either has no full subordinate conjunction or does not depend on the Main Verb of its SuperC. Three cases must be distinguished:

- the SubC has no explicit lexical marker of subordination; it can be a conjunctionless completive clause (11a), a Direct Speech clause (11b), and a conjunctionless parenthetical clause (11c);
- the SubC has an explicit lexical marker of subordination – an empty complementizer *THAT* (12a), an empty parenthetical introducer *AS* (12b), a WH-word (= interrogative-relative pronoun; e.g., *WHICH/WHAT*) as a dependent in its clause, see (12c), or a WH-word as the governor in its clause, see (12d);
- the SubC is introduced by a semantically full conjunction, but does not depend on the Main Verb of its SuperC, see (9d).

(11) The SubC includes no explicit marker of subordination

- a. *John said the stock market had gone up.*
- b. *John said, “The stock market had gone up.”*
- c. *The stock market, the government believes, will go up.*

(12) The SubC includes an explicit marker of subordination (semantically empty)

- a. *John said **that** the stock market had gone up.*
- b. *As John said, the shares went up.*¹
- c. (i) *The shares **which** John had bought a year before went up.*
 (ii) ***What** John had bought a year before turned out to be profitable.*
- d. *John left {only Mary knows **why**.}*²

In the surface-syntactic structure of a complex sentence, a non-autonomous SubC can be of any possible syntactic type: a clause that is a SSynt-actant (the Subject, the Direct Object, etc.), a parenthetical clause, a relative clause, a circumstantial, etc. (see 5.2.4).

3. Necessary syntactic-communicative notions

3.1. Introductory remarks

Roughly speaking, a sentence has two communicative structures: one at the semantic level, a **semantic** communicative structure [CommS], and another

¹ The subordinate conjunction *AS* introducing a parenthetical clause is empty in this context – it does not have a semantic source. (This *AS* is different from several semantically full conjunctions *AS* with the meanings ‘while’, ‘when’, ‘because’.)

² The last type of SubC are clauses built out of a WH-word on which depends, by the WH-relative SSynt-relation, an incomplete finite clause of a particular structure: *Only your mother knows* ←WH-rel-*who was coming* or *He lives you will* ←WH-rel-[*never guess*]-*where*.

one at the syntactic level, a **syntactic** CommS. The semantic CommS of a sentence is imposed on its semantic structure and characterizes the communicative organization of its meaning. The syntactic CommS of a sentence is imposed on its syntactic structure and characterizes the communicative organization of the sentence itself. The Synt-CommS is derived from the Sem-CommS.

The **Semantic**-Communicative Structure of a sentence was described in [10]. It is specified by the indication of Semantic-Comm-areas of a semantic structure – that is, of semantic subnetworks, which are marked by the values of eight Sem-Comm-oppositions. Namely, for each Sem-Comm-area, the corresponding value of the given Sem-Comm-opposition is indicated. However, the present paper is limited to the **Syntactic**-Communicative Structure of a sentence, where five Synt-Comm-oppositions are used: Synt-Thematicity, Synt-Givenness, Synt-Focalization, Synt-Perspective, and Synt-Emphasis [13, p. 8–10]. Out of these, only Synt-Thematicity will be considered in what follows.¹

3.2. Syntactic-Communicative Thematicity

The Synt-Comm-opposition of Thematicity has three values: Synt-Rheme, Synt-Theme, and Synt-Specifier; each Synt-thematic area carries one of these values. The Synt-Rheme and the Synt-Theme roughly correspond to the Topic and Focus of “information structure”, well known from, among others, the works of the Prague School and those of M. Halliday and K. Lambrecht. The Synt-Specifier seems to be a rather novel notion (thus, it is not mentioned, in any shape, in [3]; however, “setting” and “specification” of J. Firbas [5] clearly are its antecedents).

3.2.1. *Synt-Rheme, Synt-Theme, Synt-Specifier: Definitions*

Syntactic Rheme

|| The Syntactic Rheme [R_{Synt}] of a clause is the subtree of its syntactic structure that implements its Semantic Rheme – that is, corresponds to the chunk of the sentence’s meaning that the Speaker presents as being communicated to the Addressee.

Just as the R_{Sem} , the R_{Synt} is necessary and unique in each clause; a linguistic expression that does not have an R_{Synt} is not a clause: it is a non-clausal phrase.

¹ The system of notions proposed in [10] for the description of semantic-communicative structure of sentences is crucial for the present study. Nevertheless, we are in no position to expound, explain or justify it here; it has to be accepted as a postulate.

Syntactic Theme

|| The Syntactic Theme [T_{Synt}] of a clause is the subtree of its syntactic structure that implements its Semantic Theme – that is, corresponds to the chunk of the sentence's meaning that the Speaker presents as something on which the Semantic Rheme bears.

The T_{Synt} is also unique in a clause, but it can be absent. In such a case, we have an all-rhematic clause (e.g., *There is a polar bear over there.*). Such a clause contains only an R_{Synt} (and perhaps some Synt-Specifiers, see below), but has no T_{Synt} .

Syntactic Specifier

|| A Syntactic Specifier [SP_{Synt}] of a clause is the subtree of its syntactic structure that implements one of its Sem-Specifiers – that is, corresponds to the chunk of the sentence's meaning that the Speaker decided not to include either in the Sem-Rheme or in the Sem-Theme, but to present as a characteristic of the whole situation described by the clause or of the relation between two situations described by the complex sentence.

An SP_{Synt} is not necessary and not unique in a clause: a clause can contain no SP_{Synt} or several SP_{Synt} s. SP_{Synt} s include:

- circumstantials of time, location, cause, goal, conditions, manner, result, source of information, etc., which characterize a situation;¹
- semantically full subordinate conjunctions, such as WHEN, BECAUSE, ALTHOUGH, SINCE, 'AS IF', etc.;
- parenthetical expressions, such as UNFORTUNATELY, CURIOUSLY, I AM AFRAID, AS EVERYBODY KNOWS, etc.

All such elements do not belong to the Rheme or the Theme.

To sum up: The Synt-Thematic structure of a clause has either one R_{Synt} or one R_{Synt} and one T_{Synt} ; it may also include any number of SP_{Synt} s.

Let us illustrate the Synt-communicative notions just introduced with several sentences that express the same propositional meaning. A Synt-Thematic structure characterizes a sentence that is to appear in a particular context. In the examples, we represent this context using, as has been done for decades, an imaginary question **Q** to which the sentence under analysis can be a felicitous answer. Thus, consider the meaning in (13) and its different sentential implementations in (14) determined by different Sem-Them-structures imposed on this meaning and the different Synt-Them-structures of the corresponding sentences.²

¹ Of course, not every syntactic circumstantial corresponds to a SP_{Synt} , but only those that express a meaning not included by the Speaker in the Rheme or the Theme.

² For simplicity's sake, we illustrate the Synt-Them-structure on the sentence itself rather than on its syntactic structure. This entails some inaccuracies, which are, however, not material to this paper.

(13) ‘war’ ‘begin’ ‘whenI.3’ ‘increase’ ‘value’ ‘shares’
 $\circ \leftarrow 1 \rightarrow \circ \leftarrow 2 \rightarrow \circ 1 \rightarrow \circ \rightarrow 1 \rightarrow \circ \rightarrow 1 \rightarrow \circ$

(14) a. Q: How did the war affect the economy?

[*When war broke out.*]_{T_{Synt}} [*the stock market went up.*]_{R_{Synt}}

b. Q: What happened to the economy?

[*When war broke out.*]_{SP_{Synt}} [*the stock market went up.*]_{R_{Synt}}

In a context with no mention of the war, the subordinate WHEN-clause in (14b) expresses an SP_{Synt}

(14) c. Q: When did share prices go up?

[*The shares went up.*]_{T_{Synt}} [*when war broke out.*]_{R_{Synt}}

d. Q: What happened to share prices?

(i) [*The shares.*]_{T_{Synt}} [*went up when war broke out.*]_{R_{Synt}}

(ii) [*The shares.*]_{T_{Synt}} [*went up.*]_{R_{Synt}} [*when war broke out.*]_{SP_{Synt}}

3.2.2. Synt-Thematic structure: properties

A Synt-Them-area can be further divided into subareas: the Synt-Them-division is – as the Sem-Them-division – recursive, so that a Synt-Them-structure forms a hierarchy. Two subareas of the same area are said to be at the same level of Synt-Them-hierarchy. Three important remarks seem appropriate at this point.

1. The Synt-Them-division **applies** to one of the two basic syntactic formations – a whole sentence or a clause.¹

2. Any clause **must** undergo the Synt-Them-division (otherwise, its meaning is implemented as non-clausal phrase).²

3. A whole sentence **does not** form a Synt-Them-area.

¹ Thematically divided non-clausal phrases

There is also an additional special case – a thematically divided non-clausal phrase. A thematically divided phrase is a verbal phrase with two or more actants or circumstantials whose linear ordering is determined communicatively rather than syntactically. For instance, the Rhemes of sentences (i) and (ii) are thematically divided phrases; the different internal thematic organization of these Rhemes determines different word order in them:

(i) [*This measure.*]_{T_{Synt}} [[*would give many executives.*]_{T_{(R)Synt}}
 [*the opportunity to report trades in their own companies' shares.*]_{R_{(R)Synt}}]_{R_{Synt}}

(ii) [*This measure.*]_{T_{Synt}}
 [[*would give the opportunity to report trades in their own companies' shares.*]_{T_{(R)Synt}}
 [*to many executives.*]_{R_{(R)Synt}}]_{R_{Synt}}

² A particular case of the Synt-Them-division of a sentence is a sentence that consists of a Synt-Rheme only (an all-rhematic, orthetic, sentence); schematically, {*[...]*]_{R_{Synt}}, where curly brackets show the borders of the sentence and square brackets, those of the Synt-Rheme area.

- The Synt-Them-division of a clause has three important properties:
- it is **exhaustive**: each lexical unit in the clause's SyntS belongs to one of the Synt-Them-areas;
 - it is a **partition**: a lexical unit can belong only to one Synt-Them-area;
 - it is **recursive** (as indicated above): generally speaking, an R_{Synt} , a T_{Synt} and an SP_{Synt} allow for an internal Them-division; for instance, an R_{Synt} can be divided, in its turn, into $R_{\text{Synt}}(R_{\text{Synt}})$, $T_{\text{Synt}}(R_{\text{Synt}})$ and $SP_{\text{Synt}}(R_{\text{Synt}})$, etc.

In examples below, the borders of a Synt-Them-area are identified with square brackets subscripted with the Them-value of this area; thus, the notation “[]_{T_{Synt}}” designates a Synt-Theme area. Communicative recursion is shown by an explicit indication of the superordinate area: the notation “[]_{T(R)_{Synt}}” designates the Theme subarea of a Rheme area. Recall that clauses are enclosed in numbered curly brackets. For a clause which covers precisely one Them-area (and which does not constitute a whole sentence), the area's square brackets enclose the clause's curly brackets: [{...}], as in (15c–d); for clauses that do not coincide with one Them-area, brackets appear in an inverted order, see (15b), CLAUSE₁.

- (15) a. [*In December 1941,*]_{SP_{Synt}} [*the shares*]_{T_{Synt}} [*went up.*]_{R_{Synt}}
 b. ① { [*This measure*]_{T_{Synt}} [[*exempts many executives*]_{T(R)_{Synt}} [*from reporting such trades,*]_{R(R)_{Synt}}]_{R_{Synt}} }_①
 ② { [*McGuire*]_{T(SP)_{Synt}} [*said.*]_{R(SP)_{Synt}} }_②]_{SP_{Synt}}
 c. ① { [*When*]_{SP(T)_{Synt}} [*war*]_{T(T)_{Synt}} [*broke out,*]_{R(T)_{Synt}} }_①]_{T_{Synt}}
 ② { [*the shares*]_{T(R)_{Synt}} [*went up.*]_{R(R)_{Synt}} }_②]_{R_{Synt}}
 d. ① { [*The shares*]_{T(T)_{Synt}} [*went up.*]_{R(T)_{Synt}} }_①]_{T_{Synt}}
 ② { [*when*]_{SP(R)_{Synt}} [*war*]_{T(R)_{Synt}} [*broke out.*]_{R(R)_{Synt}} }_②]_{R_{Synt}}
 e. ① { [*When*]_{SP(SP)_{Synt}} [*war*]_{T(SP)_{Synt}} [*broke out,*]_{R(SP)_{Synt}} }_①]_{SP_{Synt}}
 ② { [*the shares*]_{T_{Synt}} [*went up.*]_{R_{Synt}} }_②
 f. ① { *The shares*
 ② { [*that = shares*]_{T(T)_{Synt}} [*McGuire had bought*]_{R(T)_{Synt}} }_②]_{T_{Synt}}
 [*went up.*]_{R_{Synt}} }_①
 g. ① { [*The shares,*]_{T_{Synt}}
 ② { [*McGuire*]_{T(SP)_{Synt}} [*reports,*]_{R(SP)_{Synt}} }_②]_{SP_{Synt}} [*went up.*]_{R_{Synt}} }_①

3.2.3. Synt-Thematic structure: representation

The Synt-ThemS is represented by means of two complementary tools.

On the one hand, any Synt-Them-area is shown by boxing the corresponding syntactic subtree; a communicative box – that is, a Synt-Them-area – has a value of Thematicity associated with it.

On the other hand, the Synt-ThemS explicitly shows communicative dependency relations between Synt-Them-values. Recall that the Synt-Rheme, the Synt-Theme and the Synt-Specifier are relational notions: a Synt-Theme and a Synt-Specifier are the Theme and a Specifier of a given Rheme; and a given Rheme may have its Theme and Specifiers.

Communicative dependency is represented – as any dependency – by arrows. We use two types of communicative dependencies and, accordingly, two types of arrows:

- The dominance communicative dependency holds between two units **of the same level** of Synt-Them-hierarchy: between a Rheme and its Theme / its Specifiers; this Comm-dependency is shown by a bold arrow: $\mathbf{SP} \leftarrow \mathbf{R} \rightarrow \mathbf{T}$. In this way, the Synt-Them-structure shows explicitly on which Rheme such and such a Theme and such and such a Specifier depends.
- The hierarchy communicative dependency holds between two Them-values **of different levels** of Synt-Them-hierarchy: between a value of a Them-area of a higher level and the Rheme of a lower level (this Rheme being inside this area). In the Synt-Them structure, it is shown by a double arrow, which always points to a Rheme, since the latter is the “head” of the lower-level Comm-dependency subtree. This is a convenient way of encoding the hierarchical inclusion of Comm-areas. For instance, $\mathbf{T} \Rightarrow \mathbf{R}$ means that this given Theme has inside of its area a Rheme of a lower level, which may have its own communicatively dominated dependents (a Theme and/or Specifiers). In example sentences, however, this hierarchical dependency is shown by a different notation: $\mathbf{R}(\mathbf{T})$ means “this Rheme’s area is included in the area of the higher Theme.”

To illustrate the Synt-Them-Structure of a complex sentence, we give Figure 4: a simplified surface-syntactic representation of sentence (16); see next page.

$$(16) \left[\left[\textit{When} \right]_{\mathbf{SP}(\mathbf{T})_{\text{Synt}}} \left[\textit{war} \right]_{\mathbf{T}(\mathbf{T})_{\text{Synt}}} \left[\textit{broke out.} \right]_{\mathbf{R}(\mathbf{T})_{\text{Synt}}} \right]_{\mathbf{T}_{\text{Synt}}} \\ \left[\left[\textit{shares} \right]_{\mathbf{T}(\mathbf{R})_{\text{Synt}}} \left[\textit{went up.} \right]_{\mathbf{R}(\mathbf{R})_{\text{Synt}}} \right]_{\mathbf{R}_{\text{Synt}}}$$

4. Syntactic division vs. syntactic-thematic division of a complex sentence

As examples (15) show, the division of a complex sentence into simple clauses does not necessarily coincide with its division into Synt-Them areas. The mismatches between clauses and concerned Synt-Them-areas are quite common. All four set-theoretical relations are possible between a clause in a complex sentence and Synt-Them-areas:

- a clause coincides with a Synt-Them-area;
- a clause includes more than one Synt-Them-area;
- a clause is included in one Synt-Them-area;
- a clause is included in two Synt-Them-areas.

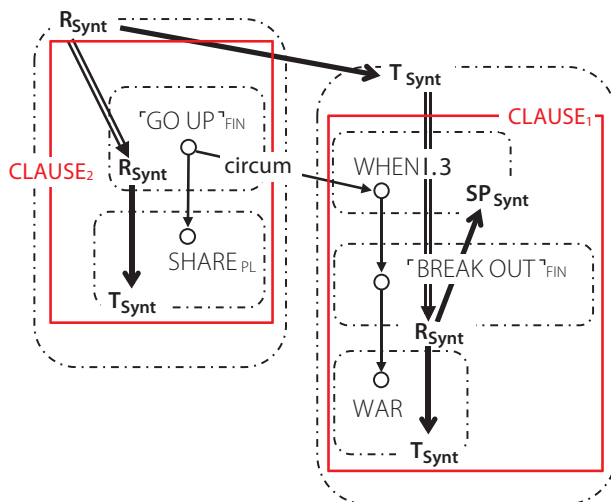


Fig. 4. A simplified surface-syntactic representation of sentence (16)

In sentence (17), CLAUSES_{1, 2, 3, 6} implement each exactly one Synt-Them-area; CLAUSES_{4, 5} include each two Synt-Them-areas; CLAUSES_{1, 2} are together included in one Synt-Them-area, the same as CLAUSES_{5, 6}. A clause “distributed” between two Synt-Them-areas is illustrated in (18): CLAUSE₁.

(17) [[_①{*Though twenty years have passed*}_①]_{R(SP1)_{Synt}}
 [_②{*since these stories were written*,}_②]_{T(SP1)_{Synt}}SP1_{Synt}
 [_③{*I think*}_③]_{SP2_{Synt}}④{[*they*]_{T_{Synt}} [*are not out of date*,]_{R_{Synt}}}_④
 [_⑤{*since*, [_⑥{*I am told*,}_⑥]_{SP(SP3)_{Synt}} [*they*]_{T(SP3)_{Synt}} [*have been*
required reading for the Department's personnel.]_{R(SP3)_{Synt}}}_⑤]_{SP3_{Synt}}

The above mismatches seriously complicate the formulations of clause-ordering rules.

5. Clause-ordering rules

5.1. Characterization of clause-ordering rules

The proposed clause-ordering rules describe the clause ordering in declarative sentences of written English, of neutral formal style. These rules are, as we said above, part of the SSyntR \Leftrightarrow DMorphR module of a linguistic model. As is the case with word order rules for lexemes within clauses [15], clause-ordering rules fall into three groups:

- local clause-ordering rules cover the placement of a SubC with respect to its SuperC (5.2);

- quasi-local clause-ordering rules determine mutual arrangements of several SubCs that are co-subordinated “in parallel” to the same SuperC and positioned, in accordance with local rules, on the same side of it (5.3);
- global clause-ordering rules filter out bad arrangements based on the consideration of the whole SyntS and Synt-ThemS of the complex sentence to be synthesized (5.4).

The **input** for clause-ordering rules is the complete surface-syntactic representation of the complex sentence to be synthesized, with a specification of simple clauses in the SyntS and full Synt-Thematic structure. Figure 5 gives an example of clause-ordering rule input – a (simplified) SSyntR of sentence (18):

(18) Q: What happened to the shares?

①{[The shares]_{T_{Synt}} [went up]} ① ②{when war broke out.} ②_{R_{Synt}}

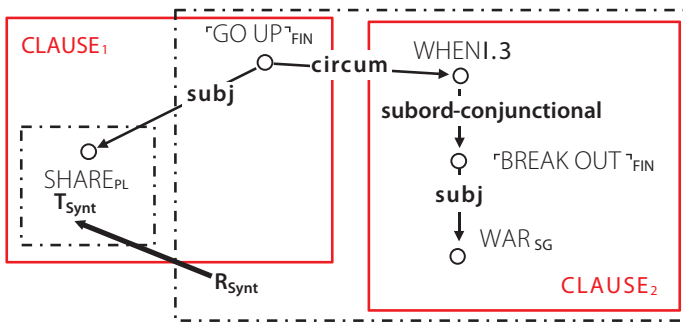


Fig. 5. A simplified SSyntR of sentence (18)

The **output** of clause-ordering rules is a linearly ordered string of simple clauses supplied, when appropriate, with an approximate indication of prosody: pauses and rising/falling contours. The resulting string of clauses must undergo all the necessary adjustments – lexical, prosodic, and morphological, see Footnote 1 on p. 19; however, the rules for clause adjustment are not considered in this paper.

For the input above, the output provided by the rules given appears as CLAUSE₁ + CLAUSE₂; it is obtained by means of rule 4, see below, p. 42.

The **information** about clauses used by the clause-ordering rules is of four types:

1) the surface-syntactic relation linking the SubC to its syntactic governor. It is explicitly shown in the starting SyntS, going from a lexeme in the SuperC to the head of the SubC;

2) the position of the SubC and its SuperC in the syntactic-communicative structure with respect to the concerned Them-areas;

3) the relevant syntactic properties of some lexemes, for instance, conjunctions: some conjunctions require the anteposition of the clause they introduce ('THE MORE'...), some others, the postposition ('IN THAT'...), see below;

4) the length of the SubC in terms of the number of stressed wordforms.

The **order of application** of the clause-ordering rules is, theoretically speaking, irrelevant: the rules are written in such a way that they can be applied in any order, provided they are applied an unlimited number of times. In practice, of course, a convenient order has to be defined; this is, however, a procedural problem, which is left out of consideration in this paper. In the illustrations, we choose the most natural order of rule application.

Notations used in clause-ordering rules

$A \rightarrow B$	element B depends on element A – semantically or syntactically
$\text{SuperC} \rightarrow \text{SubC}$	the top node of the SubC syntactically depends on a lexeme in the SuperC
$R \rightarrow T/SP$	T/SP communicatively depends on its R
$A \Rightarrow B$	Thematic subarea B is included in Thematic area A
$C_{R/T/SP}$	clause C either implements R_{Synt} , T_{Synt} , SP_{Synt} or is included in R_{Synt} , T_{Synt} , SP_{Synt} as the syntactically top clause in this area ¹
$C_{\supset R/\supset T/\subset R}$	clause C includes R_{Synt} or T_{Synt} , or else is included in R_{Synt} (without being the top clause)
SuperC-/SubC-	the initial part of an “interrupted” clause
-SuperC/-SubC	the final part of an “interrupted” clause
L	a particular lexeme
\tilde{L}	lexeme L with its syntactic dependents
\tilde{L}^*	lexeme L with its syntactic dependents except the SubCs considered in this rule
$X + Y$	Y follows X immediately
$X + \dots + Y$	Y follows X, not necessarily immediately
$\text{length}(X)$	length of the phrase X in terms of number of its stressed wordforms
\nearrow, \searrow	rising and falling intonation contours ²
,	minor and major pauses
	in the right-hand side of a rule, precedes the condition part (“if and only if”)

¹ As is typical for dependency structures, the top element in a subtree represents the whole subtree.

² Prosodic indications in our rules are approximate.

In example sentences, we give only the information relevant in each particular case.

5.2. Local clause-ordering rules

5.2.1. General conditions on local clause-ordering rules

Local clause-ordering rules are subject to the following three general syntactic conditions.

Fixed-position conjunction condition

|| **If** a SubC \supset CONJ_(ante)/CONJ_(post) **then** it is positioned before/after its SuperC.

Certain English subordinate conjunctions allow either only for the anteposition of the SubC with respect to its SuperC, or for its postposition (by the way, all coordinate conjunctions require postposition). Thus, the conjunction 'THE MORE' ... ['THE MORE' ...] requires the anteposition of its SubC,¹ and the conjunctions 'AS IF', 'IN THAT', 'SO THAT' require its postposition, as well as the relative pronoun WHICH₃ (as in *Things improved, which surprised me*). Clause-ordering rules do not apply to cases where the SubC contains such a conjunction: this SubC is linearly placed according to the corresponding feature of the conjunction.

Fixed-position conjunctions are linked with the Synt-Them-S of the sentence: under lexicalization, the selection of such a conjunction must be licensed by the thematic role of the corresponding Sem-configuration. This happens, however, in the semantic module and should not occupy us here.

Clause-border marker condition

Many languages have lexical units that could be called "clause-border markers": conjunctions and relative pronouns, which necessarily occupy the clause-initial position. In English, no lexeme that depends on an element in a conjunction-introduced clause can be linearly placed before the conjunction / the relative pronoun, which is, so to speak, the absolute left border of the clause.

Let \tilde{L} be a lexeme L with all its syntactic dependents; Ψ is either \tilde{L}_1 where $L_1 = (\text{CONJ})/(\text{rel})$ or \tilde{L}_2 where $L_2 \text{---}\dots\rightarrow \text{WHO}/\text{WHOSE}$ ("--- \rightarrow " means 'syntactic dependency, not necessarily direct').

|| **If** SuperC begins with Ψ , **then not** SubC + ... + Ψ .

¹ Our treatment of the conjunction 'THE MORE' as subordinate (even if it follows a respectable tradition: see [1, 14.13, p. 999]) needs a special justification; here it can be accepted for the sake of discussion as a hypothesis.

If a SuperC begins with Ψ – a conjunction phrase (e.g., *only*←*because*) or a phrase including a relative pronoun (e.g., *who*←*likes...* or *the letter*→*for*→*whom*), then its SubC that must precede it according to the ordering rules cannot be “physically” placed before Ψ . This means that a preceding SubC is inserted into its SuperC immediately after Ψ . See (19), where Ψ is shown by boldface, “*wo” means ‘bad because of word order’ and the trespassing clause, whose linear placement violates the Clause-Border Marker Condition, is boxed:

(19) a. ①{McGuire said}① ②**that**,③{although the war had broken out,}③
the shares had gone up.}②

vs.

*wo ①{McGuire said}①

③{although the war had broken out,}③

②**that** the shares had gone up.}②

b. ①{McGuire, ②**for whose father**, ③{as everybody knows,}③
John bought this house.}② decided to quit.}①

vs.

*wo ①{McGuire, ③{as everybody knows,}③

②**for whose father** John bought this house,}② decided to quit.}①

In (19a), the SubC_③, which – by rule 3.1 – can precede its SuperC_②, is not placed before the conjunction **that**, but immediately after it. (19b) shows the relevance of the condition that Ψ includes **who** or **whose**.¹

Clause insertion condition

|| A SubC can be linearly inserted in its SuperC under specific conditions.

For instance, a SubC inserted into its SuperC, generally speaking, cannot interrupt a complete nominal word group – that is, a previously linearized saturated nominal phrase, shown below in boldface (on the word groups, see [15]); such an interruption leads to disallowed non-projectivity. (However, in some cases, such an insertion is allowed for a parenthetical clause.)

¹ Clause-Border Marker Condition follows from the ban on non-projectivity (see below, 5.4, rule 20), so that formally it is superfluous. However, linguistically, it is important, since it explicitly expresses a relevant fact about English. In Latin, for instance, a focalized element of a subordinate clause could be placed before the subordinate conjunction: *Hanc* [= *paludem*] *si nostri transirent, hostes expectabant* lit. ‘It [= a swamp] **whether** our soldiers cross, the enemies were waiting’. = ‘The enemies waited for our soldiers to cross it’ [Caesar, *De bello Gallico*].

(20) *wo^① {*John's shares*,^② {*when the war broke out*,}^②
in General Motors went up sharply.}^①

The inverse insertion – of a SuperC into its SubC – is impossible; it is blocked by rule 20.

5.2.2. Major types of local clause-ordering rules

Local clause-ordering rules are subdivided in two groups: rules for a syntactically autonomous SubC (5.2.3) and those for a syntactically non-autonomous SubC (5.2.4).

The rules of the first group deal exclusively with a circumstantial SubC that syntactically depends on the Main Verb of its SuperC. It is linearly positioned as a function of Synt-thematic information – with respect to the whole SuperC; therefore, rules of this group have the symbol “SuperC” on their left-hand side.

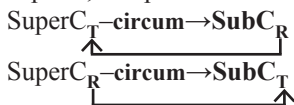
The rules of the second group cover all types of SubC (including circumstantial SubCs of a special type: rules 13 and 14); the type of SSynt-dependency of the SubC is crucial here. Such a SubC is positioned with respect to its syntactic governor L – a particular lexeme within the SuperC; the left-hand side of a second-group rule necessarily contains the symbol “L”.

This division of clause-ordering rules corresponds to the intuition that a SubC syntactically depends either on the “whole” SuperC (which, under a dependency approach, means the dependency on the top node of the SuperC), or on an individual lexeme within the SuperC (which can, but does not have to, be the top node of the SuperC).

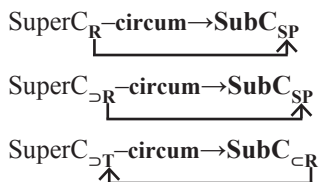
5.2.3. Local clause-ordering rules for syntactically autonomous subordinate clauses

Local clause-ordering rules target a syntactically autonomous SubC (which contains a semantically full subordinate conjunction or a meaningful syntactic construction, equivalent to such a conjunction). All syntactically autonomous SubCs are circumstantial. (But not all circumstantial SubCs are syntactically autonomous!)

The placement of a syntactically autonomous SubC with respect to its SuperC is determined by the Them-characteristics of both clauses. From this viewpoint, a SuperC–circum→SubC pair presents five attested combinations:¹



¹ Logically, more combinations are possible (e.g., the SubC can be part of the τ_{Synt} area), but we did not find the corresponding examples.

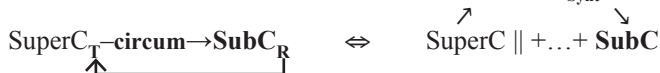


These cases are covered by four local clause-ordering rules: rules 1–4.

As is to be expected, in English the Theme-clause precedes the Rheme-clause – with one exception (accounted for in rule 2.2): an indefinite Rheme precedes its Theme.

R^{ORD} 1: Placement of SubC_{R_{Synt}}

A circumstantial Sub-clause that implements an R_{Synt} is placed after its Super-clause that implements the corresponding T_{Synt}.



(21) a. [₁{*The shares went up.*}]_{T_{Synt}} [₂{*when war broke out.*}]_{R_{Synt}}

b. [₁{*McGuire bought the shares,*
 [₂{*which were going down.*}]_{T_{Synt}} [₃{*when war broke out.*}]_{R_{Synt}}

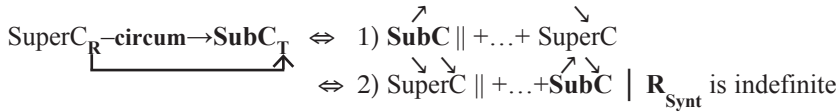
In (21b), the circumstantial SubC₃ is placed after its SuperC₁, which is the top clause in the T_{Synt} area. The relative SubC₂ is positioned – in conformity with rule 12.1 – after the noun SHARE_{PL} (not after the whole SuperC₁, so that SubC₂ finds itself inside its SuperC₁); therefore, there is no competition between SubC₃ (examined in this rule) and SubC₂ for the position after the SuperC₁.

(21) c. [₁{[*The shares*]_{T(T)_{Synt}} [*went up.*]_{R(T)_{Synt}}}]₁
 [₂{*although the opposite was expected.*}]₂SP(T)_{Synt}]_{T_{Synt}}
 [₃{*when war broke out.*}]₃R_{Synt}

In (21c), the SubC under examination (= CLAUSE₃) must follow its SuperC (= CLAUSE₁); but there is competition – between CLAUSE₃ and CLAUSE₂ (which also can follow CLAUSE₁; according to rule 3.2) – for the position **immediately** after the SuperC. The correct placement of CLAUSE₃ is ensured by the global rule 22, which forbids the Rheme to interrupt the Theme, see (46a).

R^{ORD} 2: Placement of SubC_{T_{Synt}}

A circumstantial SubC that expresses a T_{Synt} can always be placed before its SuperC that expresses the corresponding R_{Synt}, or, in a special case, after it – under the condition that this R_{Synt} is indefinite.



An \mathbf{R}_{Synt} is considered indefinite if it contains such indefinite pronouns as SOME, ONE, etc.¹

(22) a. $\mathbf{R}^{\text{ORD}} 2.1$

- (i) [$\{\text{When the war broke out,}\}_{\text{T}_{\text{Synt}}}$] [$\{\text{the shares went up.}\}_{\mathbf{R}_{\text{Synt}}}$]
 (ii) [$\{\text{But, [}\{\text{when the war broke out,}\}_{\text{T}_{\text{Synt}}}$ the shares went up.}\}_{\mathbf{R}_{\text{Synt}}}]

The correct placement of the SubC after BUT in (22a-ii) is ensured by the Clause-Border Marker Condition (General condition 2 above).

- (22) a. (iii) [$\textcircled{1}\{\text{When McGuire specified}\}_{\text{T}_{\text{Synt}}}$ [$\textcircled{2}\{\text{who can be selected,}\}_{\text{T}_{\text{Synt}}}$] [$\textcircled{3}\{\text{everybody was happy.}\}_{\mathbf{R}_{\text{Synt}}}$]
 (iv) [$\textcircled{1}\{\text{When the war broke out}\}_{\text{T}_{\text{Synt}}}$ [$\textcircled{2}\{\text{after the note had been rejected,}\}_{\text{T}_{\text{Synt}}}$] [$\textcircled{3}\{\text{the shares went up.}\}_{\mathbf{R}_{\text{Synt}}}$]

In (22a-iii/iv), the correct anteposition of CLAUSE_1 together with its dependent CLAUSE_2 is ensured by the global rule 20, which filters out cases of forbidden non-projectivity.

- (22) a. (v) [$\textcircled{1}\{\text{When the war broke out,}\}_{\text{T}_{\text{Synt}}}$ [$\textcircled{2}\{\text{although the opposite was expected,}\}_{\text{SP}_{\text{Synt}}}$] [$\textcircled{3}\{\text{the shares went up.}\}_{\mathbf{R}_{\text{Synt}}}$]

In (22a-v), unlike the preceding cases, CLAUSE_2 syntactically depends on CLAUSE_3 rather than on CLAUSE_1 . Therefore, we have here a co-subordination of CLAUSE_1 and CLAUSE_2 ; the mutual order of these two co-subordinated SubCs is free: both possible arrangements are correct.

(22) b. $\mathbf{R}^{\text{ORD}} 2.2$

- (i) Q: What is to be done to accommodate the peculiarities of crops?
 [$\text{Some modifications may be necessary.}\}_{\mathbf{R}_{\text{Synt}}}$ [$\text{if we want to accommodate the peculiarities of each crop.}\}_{\text{T}_{\text{Synt}}}$]

¹ The anteposition of an indefinite Rheme also takes place at the simple clause level:

(i) *The airfield was quiet. [Three planes]_{R_{Synt}} [were sitting on the tarmac.]_{T_{Synt}}*

(ii) **Q**: How long ago were these stories written?

[*Twenty years have passed*]_{R_{Synt}}
 [*since these stories were written.*]_{T_{Synt}}

R^{ORD} 3: Placement of SubC_{SP_{Synt}}

|| A circumstantial SubC that implements an SP_{Synt} is placed either before, or after, or within its SuperC, which implements or includes the corresponding R_{Synt}.

In other words, the linear position of an **SP_{Synt}** is considered to be optional. In fact, there could be additional factors at play, such as Givenness or length (= heaviness), etc., but we have not studied those.

“ $\supset_{R_{Synt}}$ ” is an abbreviation for the disjunction “ R_{Synt} OR $\supset_{R_{Synt}}$ ”.

SuperC _{$\supset_{R_{Synt}}$} $\xrightarrow{\text{circum}}$ SubC_{SP} \Leftrightarrow 1) SubC ^{\uparrow} || +...+ SuperC ^{\downarrow}
 \Leftrightarrow 2) SuperC ^{\uparrow} || +...+ SubC ^{\downarrow}
 \Leftrightarrow 3) SuperC- | +...+ SubC | +...+ -SuperC ^{\downarrow} ¹

(23) a. R^{ORD} 3.1

{*When the war broke out*} {*after the treaty was rejected,*}_{SP_{Synt}}
 {*[the shares]*_{T_{Synt}} [*went up.*]_{R_{Synt}}}

b. R^{ORD} 3.2

{*[The shares]*_{T_{Synt}} [*went up,*]_{R_{Synt}}} {*[when war broke out.]*}_{SP_{Synt}}

c. R^{ORD} 3.3

(i) {*[The shares,*]_{T_{Synt}} {*[when war broke out,]*}_{SP_{Synt}} [*went up.*]_{R_{Synt}}}

(ii) *wo {*[The shares,* {*[when war broke out,]*}_{SP_{Synt}}
 {*which John had bought a year ago*}_{T_{Synt}} [*went up.*]_{R_{Synt}}}

Sentence (23c-ii) is incorrect because the **SubC** separates a relative SubC from its syntactic governor, which is forbidden by the quasi-local rule 17. Cf. the correct sentence in (23c-iii):

(23) c. (iii) {*[The shares {which John had bought a year ago,}]*}_{T_{Synt}}
 {*[when the war broke out,]*}_{SP_{Synt}}
 [*went up immediately and reached a level never seen before.*]_{R_{Synt}}}

In all the sentences in (23), the SuperC does not implement a Them-area (but includes the R_{Synt}); in (24), the SuperC is R_{Synt}:

¹ 1. As indicated in Notations, “SuperC-” and “-SuperC” stand, respectively, for the initial and the final parts of the SuperC.

2. Constraining conditions are needed to determine the exact point of insertion for the **SubC**.

(24) a. R^{ORD} 3.1

- (i) [①{*When the war broke out,*}_①]_{SP_{Synt}}
 [②{*because production doubled,*}_②]_{T_{Synt}}
 [③{*the stock market went up.*}_③]_{R_{Synt}}

In (24a-i), the mutual disposition of the two co-subordinated SubCs, CLAUSE₁ and CLAUSE₂, is not constrained by quasi-local clause-ordering rules.

(24) a. (ii) [{*When the war broke out*} → {*after the treaty was rejected,*}]_{SP_{Synt}}
 [{*the influenza pandemic struck.*}]_{R_{Synt}}

b. R^{ORD} 3.2

- [{*Because production doubled,*}]_{T_{Synt}}
 [{*the stock market went up*}]_{R_{Synt}} [{*when war broke out.*}]_{SP_{Synt}}

c. R^{ORD} 3.3

- {[*The stock market* [{*although war broke out*}]_{SP_{Synt}} *went up.*]_{R_{Synt}}}

R^{ORD} 4: Placement of SubC_{cR_{Synt}}

|| A circumstantial SubC that is included in an R_{Synt} Them-area is placed after its SuperC, which includes the corresponding T_{Synt}

SuperC_cT_{Synt}—circum—→SubC_{cR} ⇔ SuperC + ... + SubC

- (25) a. ①[{*The shares*]_{T_{Synt}} [*went up the next year,*]}_①
 ②{*when war broke out.*}_②]_{R_{Synt}}
 b. ①[{*McGuire*]_{T_{Synt}} [*bought the shares,*]}_①
 ②{*since he had the opportunity,*}_② ③{*when war broke out.*}_③]_{R_{Synt}}

5.2.4. Local clause-ordering rules for syntactically non-autonomous subordinate clauses

The placement of a syntactically non-autonomous SubC is determined by the type of the surface-syntactic relation that subordinates it to a lexeme in the SuperC – not necessarily the Main Verb, as indicated above. Twelve SSyntRels can link the SuperC and its SubC:

- six surface-actantial SSyntRels – that is, **subjectival**, **pseudo-subjectival**¹, **direct-objectival**, **direct-speech-objectival**,² **indirect-objectival** and **oblique-objectival** SSyntRels;

¹ The **pseudo-subjectival** relation was called “quasi-subjectival” in previous publications. The Pseudo-Subject is the element of the clause that expresses the DSynt-actant *i* in a clause with the dummy Subject (IT in English; for instance, *It is*–[*strange*]–**pseudo-subj**→ *that John should say so*, where the subordinate clause *that John should say so* constitutes a Pseudo-Subject).

² Direct Speech

Direct Speech [DS] and Direct Speech Introdutor [DSI], or reporting clause, form two different syntactic constructions (this distinction was stated in [1, p. 1022–1023]): DS is the syntactic dependent or the syntactic governor.

- copular SSyntRel;
- comparative SSyntRel;
- relative SSyntRel;
- circumstantial SSyntRel;
- parenthetical SSyntRel;
- quasi-parenthetical SSyntRel (= subordinates a Direct-Speech Introductor).

To order the corresponding clauses rules 5–15 are needed. (Rules of this type for linearization of lexemes within English clauses can be found in [16].)

R^{ORD} 5: Placement of a subjectival SubC

|| A subjectival SubC is placed before its syntactic governor and all other dependents of the latter.

L-subjectival → SubC ⇔ SubC + ... + L*

- (26) a. ① {*That phlogiston theory was flawed*}_①
 ② {*finally became_L clear in the 1830s*}_②

The DSI is the SuperC, and the DS is its SubC.

The DS is a syntactic dependent of the Main Verb of its DSI; it is subordinated to this MV by the **direct-speech-objectival** surface-syntactic relation. Note that the DS cannot be considered as a genuine direct object of the reporting clause, since there is a semantic contrast of the type *John whispered three words* [direct object] vs. *John whispered, “Three words”* [direct-speech object]; for more, see [7, p. 218–220].

Communicatively, the DS is either the R_{Synt} or a part of the R_{Synt} of the whole sentence. The DSI is either the T_{Synt} or consists of the T_{Synt} and a part of the R_{Synt} . The only linear position available for the DS is after the DSI:

- (i) a. Q: What did McGuire say?
 [McGuire said,]_{T_{Synt}} [“The biotechnology firms are setting up their own competitors.”]_{R_{Synt}}
 b. Q: What about McGuire?

 [McGuire]_{T_{Synt}} [took the floor_{T_{Synt}} and said, “The biotechnology firms are setting up their own competitors.”]_{R_{Synt}}

The DSI is the SubC, and the DS is its SuperC.

The DSI is syntactically an adverbial, similar to a parenthetical, that depends on the DS by the **quasi-parenthetical** surface-syntactic relation: it is not a stand-alone phrase, it is omissible, carries a parenthetical prosody, and its linear position with respect to the DS is relatively free. However, it is not a genuine parenthetical: it cannot be replaced with a synonymous clause introduced by AS (*“I will not go there!”, as *John said*) and it is not repeatable with the same governor – unlike “normal” parentheticals.

Communicatively, the DSI is necessarily an SP_{Synt} :

- (ii) Q: What about the biotechnology firms?
 a. [“The biotechnology firms”]_{T_{Synt}} [are setting up their own competitors.”]_{R_{Synt}}
 [said McGuire, president of the Biotechnology Association.]_{SP_{Synt}}
 b. [“The biotechnology firms”]_{T_{Synt}} [said McGuire, president of the Biotechnology Association.]_{SP_{Synt}}
 [are setting up their own competitors.”]_{R_{Synt}}

- (26) b. $\textcircled{1} \{ \textit{That John insisted} \} \textcircled{1} \textcircled{2} \{ \textit{he had not been there} \} \textcircled{2}$
 $\textcircled{3} \{ \textit{amazed}_L \textit{ everybody.} \} \textcircled{3}$
 c. $\textcircled{1} \{ \textit{What John had bought last year} \} \textcircled{1}$
 $\textcircled{2} \{ \textit{later turned}_L \textit{ out to be valuable.} \} \textcircled{2}$

A SuperC can include its SubC as a necessary clausal element, like what we see in (26).

In (26b), R^{ORD}5 correctly positions CLAUSE₁; the placement of CLAUSE₂ is carried out by rule 7.1, while the correct mutual arrangement of CLAUSE₂ and CLAUSE₃ is ensured by rule 20 (non-projectivity).

R^{ORD} 6: Placement of a pseudo-subjectival SubC

|| A pseudo-subjectival SubC is placed after its syntactic governor and all other dependents of the latter.

L–pseudo-subjectival → SubC ⇔ $\overset{\nearrow}{L^*} | + \dots + \underset{\searrow}{\text{SubC}}$

- (27) a. *It amazed_L us that John left early.*
 b. (i) $\textcircled{1} \{ \textit{It is}_L \textit{ a shame} \} \textcircled{1} \textcircled{2} \{ \textit{that you speak Lushootseed so poorly.} \} \textcircled{2}$
 $\textcircled{3} \{ \textit{if we consider how much effort you've put into it.} \} \textcircled{3}$
 (ii) $\textcircled{1} \{ \textit{It is}_L \textit{ a shame.} \} \textcircled{1}$
 $\textcircled{3} \{ \textit{if we consider how much effort you've put into it.} \} \textcircled{3}$
 $\textcircled{2} \{ \textit{that you speak Lushootseed so poorly.} \} \textcircled{2}$
 c. $\textcircled{1} \{ \textit{It is}_L \textit{ strange} \} \textcircled{1} \textcircled{2} \{ \textit{how empty these paintings look now.} \} \textcircled{2}$

R^{ORD} 7: Placement of a direct-objectival SubC

|| A direct-objectival SubC is placed after its syntactic governor.

L–direct-objectival → SubC ⇔ $\overset{\nearrow}{L} + \dots + \underset{\searrow}{\text{SubC}}^1$

- (28) a. $\{ \textit{McGuire said}_L \} \{ \textit{(that) the biotechnology firms are setting up their own competitors.} \}$
 b. $\{ \textit{McGuire knows}_L \textit{ exactly} \} \{ \textit{where this data can be found} \}$
 $\textit{from his agents in Mexico.} \}$
 c. $\{ \textit{McGuire knows}_L \} \{ \textit{although he does not say so.} \}$
 $\{ \textit{where this data can be found.} \}$
 d. $\{ \textit{John married}_L \} \{ \textit{you cannot even start guessing whom.} \}$

¹ This rule does not cover such cases where a Focalized (rhetic or thematic) direct-objectival SubC precedes its syntactic governor, e.g., *Where the advantage lay, he could not have said*. Additional rules are needed to determine the mutual disposition of a clausal DirO and other actants of L.

R^{ORD} 8: Placement of a direct-speech SubC

|| A direct-speech-objectival SubC is placed after its syntactic governor and all other dependents of the latter (i.e., after the Direct-Speech Introductor).

L -direct-speech-objectival → SubC ⇔ \tilde{L}^* || + SubC

(29) {*McGuire, the president of the Gruman Company, said_L, addressing the press:*}
 {*“The biotechnology firms are setting up their own competitors.”*}

A sentence where the Direct Speech precedes the Direct-Speech Introductor, such as “*The biotechnology firms are setting up their own competitors,*” *said McGuire*, manifests a different syntactic structure: see Footnote 2, p. 42–43.

R^{ORD} 9: Placement of an indirect-/oblique-objectival SubC

|| An indirect-/oblique-objectival SubC is placed after its syntactic governor.

L -indirect-/oblique-objectival → SubC ⇔ L + ... + SubC

Indirect-/oblique-objectival SubCs are of two basic types: THAT-introduced SubCs and headless relatives.

(30) a. {*We are sorry_L*} {*(that) we have to leave early.*}
 b. {*McGuire weighs_L in*} {*on what is wrong with our school.*}

R^{ORD} 10: Placement of a copular-complement SubC

|| A copular-complement SubC is placed after its syntactic governor.

L -copular → SubC ⇔ L + ... + SubC

(31) {*Kremlin’s hope is_L*} {*as the author believes,*}
 {*that Ukraine will implode under weight of its economic problems.*}

R^{ORD} 11: Placement of a comparative SubC

|| A comparative SubC is placed after its SuperC (which contains the lexeme L – the syntactic governor of the SubC).

L -comparative → SubC ⇔ SuperC(L) | + ... + SubC

The right-hand side of this rule needs SuperC(L) rather than \tilde{L} , because of its SSyntS; otherwise, the SubC would be incorrectly placed after L.

(32) a. {*The service is less_L ← efficient now*} {*than it was 10 years ago.*}
 b. {*The service is as_L ← efficient now*} {*as it was 10 years ago.*}

A special case of the comparative construction is the construction with **so** or **SUCH**:

- (33) a. $\{I\ am\ so_L \leftarrow tired\} \{that\ my\ eyelids\ are\ closing\ on\ their\ own.\}$
 b. $\{He\ is\ such_L \leftarrow [an]-idiot\}$
 $\{that\ you\ never\ know\ \{what\ is\ to\ be\ expected\ from\ him.\}\}$

R^{ORD} 12: Placement of a relative SubC

|| In a general case, a relative SubC is placed after its syntactic governor L and all other syntactic dependents of the latter; in a special case (according to the conditions sketched below), it is placed immediately after the whole SuperC.

Conditions $C = \begin{cases} 1) length(\mathbf{SubC}) > length(\tilde{V}_{FIN}^*); \\ 2) \text{not } L \leftarrow \text{subj} - MV_{(trans)FIN} - \text{dir-obj} \rightarrow L' \end{cases}$

$L - \text{relative} \rightarrow \mathbf{SubC} \quad \Leftrightarrow \quad \begin{array}{l} 1) \tilde{L}^* + \dots + \mathbf{SubC} \\ 2) \text{SuperC}(L) || + \mathbf{SubC} \end{array} \quad \left| \begin{array}{l} \text{not } C \\ C \end{array} \right.$

Conditions that determine the possibility or the necessity of a “separated” relative SubC are formulated here in quite an approximate way – just to stake out the problem. Rule 12.2 describes a case of allowed non-projectivity (rule 20): the arrow of the relative dependency covers the syntactic head of the SuperC.

The prosody in a relative clause depends on what it is relative to.

(34) a. R^{ORD} 12.1

The shares_L {that John had bought a year before} went up.

b. R^{ORD} 12.2 (for so-called separated relative clauses)

(i) $\{A\ system_L\ emerged\} \{that\ was\ free\ of\ these\ drawbacks.\}$

(ii) $\{Several\ topics\ are\ discussed\ there\}$

$\{that\ reflect\ the\ support\ of\ institutional\ governance.\}$

Sentences (34b-i/ii) illustrate the relevance of the heaviness (= length) of the relative SubC.

(34) b. (iii) $*w^o \{The\ system_L\ made\ serious\ mistakes,\}$

$\{that\ was\ supposed\ to\ be\ free\ of\ these\ drawbacks.\}$

Sentence (34b-iii) illustrates the impossibility of a separated relative clause following a transitive verb with its DirO.

R^{ORD} 13: Placement of a circumstantial WH-SubC that depends on a finite verb

$\mathbf{SubC} = \Psi \leftarrow \text{WH-reI} - L'_{(wh)}$ (the SubC consists of a phrase Ψ depending on a WH-word)

|| A circumstantial SubC of said type is placed after its syntactic governor.

$L_{(V)FIN} - \text{circum} \rightarrow \mathbf{SubC} \quad \Leftrightarrow \quad L_{(V)FIN} + \dots + \mathbf{SubC}$

This rule deals with a particular type of SubC: a phraseologized expression consisting of a WH-word on which depends – by a special **wh-relative** surface-syntactic relation – a finite verb (from a limited set) with its subject (from an open-ended set) and perhaps other dependents: *John lives **nobody cares where**, John left your mother wouldn't guess why*.

(35) {*John spends_L every night {**God knows where**} with his pals.*}

R^{ORD} 14: Placement of a circumstantial SubC that does not depend on a finite verb

|| A circumstantial SubC that does not depend on a finite verb is placed immediately after its syntactic governor and all its other dependents.

$L_{\text{non(V)FIN}}\text{-circum} \rightarrow \text{SubC} \quad \Leftrightarrow \quad \tilde{L}^* + \text{SubC}$

(36) {*John, the invincible jester, half an invalid_L,
{for his heart always gave him trouble},
would be the last to agree to stop.*}

R^{ORD} 15: Placement of a parenthetical/quasi-parenthetical SubC

|| A parenthetical/quasi-parenthetical SubC is placed before, after or inside its SuperC (which contains the lexeme L – the syntactic governor of the SubC)¹.

$L\text{-parenthetical/quasi-parenthetical} \rightarrow \text{SubC} \quad \Leftrightarrow$

\Leftrightarrow 1) **SubC** + ... + SuperC(L) | if [MV(SubC) is a communication/opinion verb and **topnode**(SuperC) \neq CONJ],
then **topnode**(SubC) = AS

\Leftrightarrow 2) SuperC(L) + ... + **SubC**

\Leftrightarrow 3) SuperC(L) - ... + **SubC** + ... + -SuperC(L) | **INSERT**(PARENTH, CLAUSE)

Rule 15.3 ensures the insertion of a parenthetical SubC into its SuperC. Since the conditions for the placement of a parenthetical inside its SuperC are rather complex, they are preferably united in a separate operator **INSERT**(PARENTH, CLAUSE); the elaboration of this operator is a challenging task, which cannot be tackled here.

(37) a. **R^{ORD} 15.1**

(i) {*As **McGuire reports**, {the shares went_L up.}*}

(ii) {*When, {(as) **McGuire reports**,} the shares went_L up,}
{John sold them.}*}

¹ Although communicatively a parenthetical or quasi-parenthetical SubC is a **SP_{Synt}** rule 15 cannot be subsumed under rule 3 (by considering the parentheticals as circumstantial), since the parentheticals feature specific properties – among other things, a parenthetical, unlike a circumstantial, is not introduced by a semantically full conjunction but requires the conditions for the introduction of the empty conjunction AS (cf. the condition in rule 15.1).

(37) a. (iii) *^{w0}*McGuire reports* (*Reports McGuire*), *the shares went_L up*.

Sentence (37a-iii) is ungrammatical, since it contradicts the condition.

The sentence *McGuire reports the shares went up* is possible – as the realization of a syntactic structure in which the SubC is completive – that is, the direct object of the verb REPORT with the complementizer THAT omitted. It is prosodically different from (37a-iii).

(37) a. (iv) {*These stories are not out of date*}
 {*since, {I am told,} they are_L still widely read.*}

Here the parenthetical clause *I am told* can be without AS since its SuperC is introduced by a conjunction (= SINCE).

(37) b. R^{ORD} 15.2

- (i) {*The shares went_L up,*}
 {*as McGuire reports* (*as reports McGuire*).}
- (ii) {“*I don’t_L know*”} {*McGuire said* (*said McGuire*).}

c. R^{ORD} 15.3

- (i) {*Fortunately, {McGuire reported on March 15th,*}
the shares are_L going up.}
- (ii) {*On March 15th, {(as) McGuire reports,} the shares went_L up.*}
- (iii) {“*On March 15th, {reports McGuire,} I saw_L the shares go up.*”}

5.3. Quasi-local clause-ordering rules

Local clause-ordering rules state correspondences between tree-like structures and their linear embodiments; more precisely, they determine the placement of a SubC with respect to its SuperC or to a lexical unit in the SuperC. In contrast, quasi-local and global clause-ordering rules are filters: they ban some ungrammatical and/or questionable arrangements.

Quasi-local clause-ordering rules take care of the mutual arrangement of two co-subordinated contiguous Cs – that is, two Co-SubCs that are to be positioned on the same side of their SuperC.¹

Being a filter, a quasi-local clause-ordering rule specifies the impossible mutual disposition of two Co-SubCs. An arrangement not precluded by any quasi-local rule is considered correct (at this stage: it still can be rejected by global rules, which consider the syntactic structure of the whole sentence).

¹ Two Co-SubCs can have two different governors within the same SuperC; thus, one of the Co-SubCs may depend on the MV of the SuperC, while the other depends on a different lexical element.

- avoid more than double left-branching of clauses (“left branching” is linearly positioning a SubC before its SuperC);
- avoid repeated embedding of clauses;
- avoid non-projective ordering of clauses;
- avoid ordering of clauses leading to syntactic ambiguity.

We can turn these indications into global rules 18–21, presented here informally.

R^{ORD} 18: Avoid more than double left branching of clauses

$\text{SubC}_1 \leftarrow \text{SubC}_2 \leftarrow \text{SubC}_3 \leftarrow \text{SuperC} \Leftrightarrow *^{\text{wo}} \text{SubC}_1 + \text{SubC}_2 + \text{SubC}_3 + \text{SuperC}$

- (41) a. $\textcircled{2} \{ \text{When, } \textcircled{1} \{ \text{if the war breaks out,} \} \textcircled{1} \text{ the shares go up,} \} \textcircled{2}$
 $\textcircled{3} \{ \text{we could sell them.} \} \textcircled{3}$

This sentence is somewhat clumsy, but correct because it manifests only double left branching. Note that, according to the Clause-Border Marker Condition (5.2.1), SubC_1 is considered to precede SubC_2 ; the same holds for (41b).

- (41) b. $*^{\text{wo}} \textcircled{3} \{ \text{When, } \textcircled{2} \{ \text{if } \textcircled{1} \{ \text{although everybody tried to prevent it,} \} \textcircled{1}$
 $\text{the war breaks out,} \} \textcircled{2} \text{ the shares go up,} \} \textcircled{3}$
 $\textcircled{4} \{ \text{we could sell them.} \} \textcircled{4}$

A triple left branching is disallowed; cf. the correct sentence (41c), with only double left branching (since SubC_1 is positioned to the right of its governor, SubC_2):

- (41) c. $\textcircled{3} \{ \text{When, } \textcircled{2} \{ \text{if the war breaks out,} \} \textcircled{2}$
 $\textcircled{1} \{ \text{although everybody tried to prevent it,} \} \textcircled{1}$
 $\text{the shares go up,} \} \textcircled{3} \textcircled{4} \{ \text{we could sell them.} \} \textcircled{4}$

R^{ORD} 19: Avoid double embedding of clauses

$\text{SubC}_1 \leftarrow \text{SubC}_2 \leftarrow \text{SuperC} \Leftrightarrow *^{\text{wo}} \text{SuperC} - + \text{SubC}_2 - + \text{SubC}_1 + - \text{SubC}_2 + - \text{SuperC}$

- (42) $*^{\text{wo}} \{ \text{The shares, } \textcircled{2} \{ \text{when the war, } \textcircled{1} \{ \text{after the treaty had been rejected} \} \textcircled{1}$
 $\text{broke out,} \} \textcircled{2} \text{ went up.} \}$

R^{ORD} 20: Avoid arrangements leading to disallowed non-projectivity

For instance, unlike sentence (43a), sentence (43b) is bad because of its non-projectivity:

- (43) a. $\textcircled{1} \{ \text{McGuire said} \} \textcircled{1} \textcircled{2} \{ \text{that, } \textcircled{3} \{ \text{while S.E.C. regulates filing,} \} \textcircled{3}$
 $\text{the law determines the status of clients.} \} \textcircled{2}$
- b. $*^{\text{wo}} \textcircled{3} \{ \text{While S.E.C. regulates filing,} \} \textcircled{3} \textcircled{1} \{ \text{McGuire said} \} \textcircled{1} \rightarrow$
 $\textcircled{2} \{ \text{that the law determines the status of clients.} \} \textcircled{2}$

Sentence (43b) can be grammatical – as the expression of a different SSynt-structure, where the WHILE-clause depends on SAY rather than on DETERMINE.

An interesting case of disallowed non-projectivity is the impossibility of inserting a SuperC in its SubC:

(44) *wo₁ {When the war, ₂ {the shares went up,} ₂ broke out.} ₁

However, as is well known, several situations of non-projectivity are acceptable in English syntax. Here we indicate only four of them (additional constraints are not mentioned).

Four allowed cases of non-projectivity

1) $L_{(N)}(C_1) + L_{(V, \text{ intrans})}(C_1) + C_2$ such that
 $L_{(V, \text{ intrans})}$ -**subjectival**→ $L_{(N)}$ -**relative**→ C_2

Recently a book←appeared which is a dialogue between Pope Francis and a Jewish rabbi.

2) $L_{(\text{compar})}(C_1) + L_{(A)}(C_1) + C_2$ such that
 $L_{(A)}$ -**restrictive**→ $L_{(\text{compar})}$ -**comparative**→THAN

The service is less_L←efficiently conducted now than it was 10 years ago.

3) $so(C_1) + L_{(A)}(C_1) + C_2$ such that
 $L_{(A)}$ -**restrictive**→SO-**comparative**→THAT

I am so ← tired that my eyelids are closing on their own.

4) $C_1 + C_2 + C_3$ such that C_3 -**circumstantial**→ C_1, C_2 -**dir-objectival**→ C_3
 and $MV(C_2)$ is a mental/communication verb

Although these books were published 20 years ago, John thinks→
 that they are not dated.

R^{ORD} 21: Avoid arrangements leading to syntactic ambiguity

?wo $C_1 + C_2 + C_3$ such that C_1 → C_3 and C_2 → C_3 are potentially possible.

(45) a. ?wo₁ {You believe} ₁ ₂ {that life will love you back} ₂
₃ {if you love life.} ₃

This sentence is ambiguous in the written text (orally, prosody allows for disambiguation): C_3 can depend either on C_1 or C_2 , both interpretations making perfect sense. Therefore, the following arrangements are preferable:

(45) b. ₃ {if you love life,} ₃←₁ {you believe} ₁
₂ {that life will love you back.} ₂

- c. $\textcircled{1}\{\textit{You believe,}\}_{\textcircled{1}} \rightarrow \textcircled{3}\{\textit{if you love life,}\}_{\textcircled{3}}$
 $\textcircled{2}\{\textit{that life will love you back.}\}_{\textcircled{2}}$
- d. $\textcircled{1}\{\textit{You believe}\}_{\textcircled{1}} \textcircled{2}\{\textit{that,}\}_{\textcircled{2}} \textcircled{3}\{\textit{if you love life,}\}_{\textcircled{3}} \leftarrow$
 $\textcircled{2}\{\textit{life will love you back.}\}_{\textcircled{2}}$

To these four global rules, at least one other has to be added, taking into account the Synt-Them-structure.

R^{ORD} 22: Avoid arrangements in which an R_{Synt} linearly divides a T_{Synt} (of the same level) or vice versa

$*w_0 C_1 + C_2 + C_3$ such that C_1 and C_3 belong to $T_{\text{Synt}}/R_{\text{Synt}}$, and C_2 belongs to $R_{\text{Synt}}/T_{\text{Synt}}$.

- (46) a. (i) $\textcircled{1}[\textcircled{1}\{\textit{The shares}\}_{\textcircled{1}} \textcircled{2}[\textcircled{2}\{\textit{although funds were not available,}\}_{\textcircled{2}} \textcircled{3}[\textcircled{3}\{\textit{when the war broke out.}\}_{\textcircled{3}}]_{\text{R}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}]_{\text{SP}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}$
- (ii) $*w_0 \textcircled{1}[\textcircled{1}\{\textit{The shares}\}_{\textcircled{1}} \textcircled{2}[\textcircled{2}\{\textit{when the war broke out,}\}_{\textcircled{2}} \textcircled{3}[\textcircled{3}\{\textit{although funds were not available.}\}_{\textcircled{3}}]_{\text{R}_{\text{Synt}}}]_{\text{SP}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}$

Sentence (46a-ii) is grammatical as an expression of a different Them-structure, CLAUSE_1 being T_{Synt} , $\text{CLAUSE}_2 - R_{\text{Synt}}$, and $\text{CLAUSE}_3 - \text{SP}_{\text{Synt}}$.

- (46) b. (i) $\textcircled{1}[\textcircled{1}\{\textit{That John insisted}\}_{\textcircled{1}} \textcircled{2}[\textcircled{2}\{\textit{he had not been there}\}_{\textcircled{2}}]_{\text{T}_{\text{Synt}}}]_{\text{R}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}$
- (ii) $*w_0 \textcircled{1}[\textcircled{1}\{\textit{That John insisted}\}_{\textcircled{1}} \textcircled{2}[\textcircled{2}\{\textit{he had not been there.}\}_{\textcircled{2}}]_{\text{T}_{\text{Synt}}}]_{\text{R}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}$

Unlike T_{Synt} and R_{Synt} , an SP_{Synt} can interrupt the expressions of other Them-areas:

- (47) $\textcircled{1}[\textcircled{1}\{\textit{The service,}\}_{\textcircled{1}} \textcircled{2}[\textcircled{2}\{\textit{although the government denies it,}\}_{\textcircled{2}} \textcircled{3}[\textcircled{3}\{\textit{is less efficient now}\}_{\textcircled{3}}]_{\text{SP}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}$ $\textcircled{4}[\textcircled{4}\{\textit{than it was 10 years ago.}\}_{\textcircled{4}}]_{\text{R}_{\text{Synt}}}]_{\text{T}_{\text{Synt}}}$

6. Applying clause-ordering rules: an illustration

To illustrate our rules, we will examine two rather complex sentences. These illustrations present:

- the sentence S to be synthesized, with the division into clauses and Synt-Them-areas specified;
- a schema of syntactic links between clauses of S , where each clause is supplied with an explicit indication of its position with respect to Synt-Them-areas and each link, with the number of the rule applied to it;
- the SSyntR of S , with a partial Synt-ThemS (without showing the internal Them-division, where it is immaterial);

- the list of rules relevant for constructing S ;
- the final string of clauses that compose S .

Example 1

(48) [①{McGuire said}①]_{T_{Synt}}
 [②{that, [③{while [the S.E.C.]_{T(SP(R))_{Synt}} [regulates]③
 ④{who files,}④]_{R(SP(R))_{Synt}} SP(R)_{Synt} [the law]_{T(R)_{Synt}} [tells them]②
 ⑤{when they can do so.}⑤]_{R(R)_{Synt}}]_{R_{Synt}}

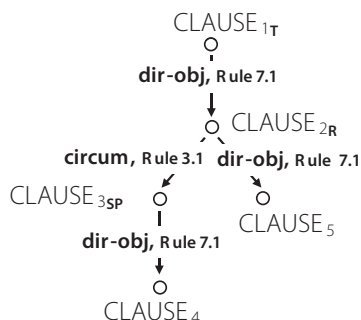


Fig. 6. The schema of syntactic links between clauses of sentence (48)

Fig. (7) – the SSyntR of sentence (48) – is given on the next page.

The application of clause-ordering rules in sentence (48)

CLAUSE₁–**dir-obj**→CLAUSE₂: R^{ORD} 7.1 gives the arrangement CLAUSE₁ + CLAUSE₂.

CLAUSE₂–**circum**→CLAUSE₃: R^{ORD} 3.1 gives the arrangement CLAUSE₃ + CLAUSE₂, which leads to a conflict: should CLAUSE₃ be positioned before CLAUSE₁, which is followed by CLAUSE₂, or between the two – that is, immediately before CLAUSE₂? The answer comes from a global clause-ordering rule, R^{ORD} 20, which forbids arrangements leading to non-projectivity. In this case, the interposition of CLAUSE₁ results in non-allowed non-projectivity:

*^{wo}CLAUSE₃ + CLAUSE₁ + CLAUSE₂.

The resulting correct arrangement is CLAUSE₁ + CLAUSE₃ + CLAUSE₂¹.

R^{ORD}3.2 and R^{ORD} 3.3 are also applicable, producing two more variants of clause ordering.

CLAUSE₃–**dir-obj**→CLAUSE₄: R^{ORD} 7.1 gives CLAUSE₃ + CLAUSE₄; CLAUSE₄ follows CLAUSE₃ and precedes CLAUSE₂. The incorrect arrangement *^{wo}CLAUSE₃ + CLAUSE₂ + CLAUSE₄ is banned by the same global rule as above: R^{ORD}

¹ Taking into account the Clause-Border Marker Condition, CLAUSE₃ is placed after the conjunction THAT, which is part of CLAUSE₂.

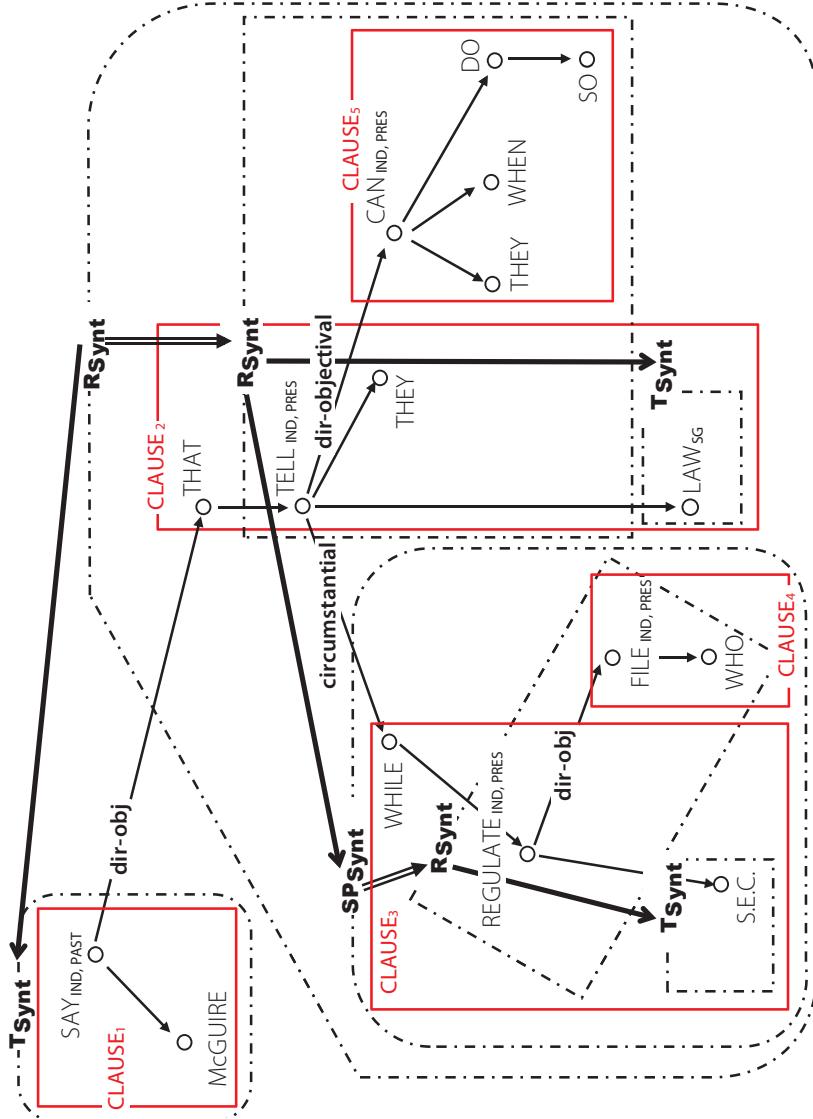


Fig. 7. A simplified surface-syntactic representation of sentence (48)

20; the correct arrangement is $\text{CLAUSE}_1 + \text{CLAUSE}_3 + \text{CLAUSE}_4 + \text{CLAUSE}_2$.
 $\text{CLAUSE}_2\text{-dir-obj} \rightarrow \text{CLAUSE}_5$: $R^{\text{ORD}} 7.1$ gives $\text{CLAUSE}_2 + \text{CLAUSE}_5$.

The final result is $\boxed{\text{CLAUSE}_1 + \text{CLAUSE}_3 + \text{CLAUSE}_4 + \text{CLAUSE}_2 + \text{CLAUSE}_5}$.

Example 2

(49) $[[\textcircled{1}\{\textit{Though twenty years have passed}\}\textcircled{1}]_{R(\text{SP1})_{\text{Synt}}}$
 $[\textcircled{2}\{\textit{since these stories were written,}\}\textcircled{2}]_{T(\text{SP1})_{\text{Synt}}}]_{\text{SP1}_{\text{Synt}}}$
 $[\textcircled{3}\{\textit{I think}\}\textcircled{3}]_{\text{SP2}_{\text{Synt}}} \textcircled{4}\{\{\textit{they}\}\}_{T_{\text{Synt}}} [\textit{are not out of date,}]_{R_{\text{Synt}}}\textcircled{4}$
 $[\textcircled{5}\{\textit{since, } [\textcircled{6}\{\textit{I am told,}\}\textcircled{6}]_{\text{SP}(\text{SP3})_{\text{Synt}}} [\textit{they}\}_{T(\text{SP3})_{\text{Synt}}} [\textit{have been}$
 $\textit{required reading for the Department's personnel.}]_{R(\text{SP3})_{\text{Synt}}}\textcircled{5}]_{\text{SP3}_{\text{Synt}}}$

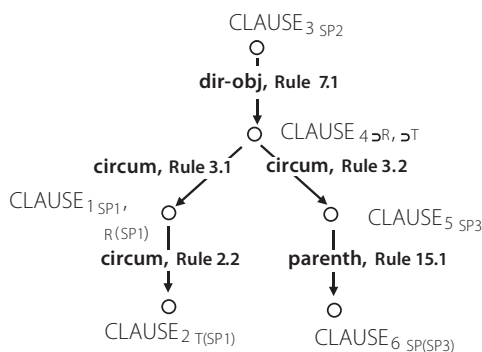


Fig. 8. The schema of syntactic links between clauses of sentence (49)

Fig. (9) – the SSyntR of sentence (49) – is given on the next page.

The Application of Clause-Ordering Rules in Sentence (49)

$\text{CLAUSE}_1\text{-circum} \rightarrow \text{CLAUSE}_2$: $R^{\text{ORD}} 2.2$ gives $\text{CLAUSE}_1 + \text{CLAUSE}_2$. ($R^{\text{ORD}} 2.1$ is also applicable and produces another possible variant: $\text{CLAUSE}_2 + \text{CLAUSE}_1$; recall that if a Sub-clause C_α has to precede its Super-clause C_β introduced by a conjunction, C_α is linearly positioned immediately after this conjunction: 5.2.1, Clause-Border Marker Condition.)

$\text{CLAUSE}_4\text{-circum} \rightarrow \text{CLAUSE}_1$: $R^{\text{ORD}} 3.1$ gives $\text{CLAUSE}_1 + \text{CLAUSE}_4$. ($R^{\text{ORD}} 3.2$ and $R^{\text{ORD}} 3.3$ are also applicable.) CLAUSE_4 can be positioned either immediately after CLAUSE_1 (thus preceding CLAUSE_2), or after CLAUSE_2 . The arrangement $*\text{CLAUSE}_1 + \text{CLAUSE}_4 + \text{CLAUSE}_2$ is precluded by global rule $R^{\text{ORD}} 20$ (forbidden non-projectivity); the remaining correct string is $\text{CLAUSE}_1 + \text{CLAUSE}_2 + \text{CLAUSE}_4$.

$\text{CLAUSE}_3\text{-dir-obj} \rightarrow \text{CLAUSE}_4$: $R^{\text{ORD}} 7.1$ gives $\text{CLAUSE}_3 + \text{CLAUSE}_4$. As a result, we obtain three alternative strings:

- 1) either $\text{CLAUSE}_3 + \text{CLAUSE}_1 + \text{CLAUSE}_2 + \text{CLAUSE}_4$;
- 2) or $\text{CLAUSE}_1 + \text{CLAUSE}_3 + \text{CLAUSE}_2 + \text{CLAUSE}_4$;
- 3) or $\text{CLAUSE}_1 + \text{CLAUSE}_2 + \text{CLAUSE}_3 + \text{CLAUSE}_4$.

Arrangement 2 is precluded by global rule $R^{ORD} 20$ (non-projectivity); both arrangements 1 and 3 are possible.

$CLAUSE_4$ —**circum**→ $CLAUSE_5$: $R^{ORD} 3.2$ gives $CLAUSE_4 + CLAUSE_5$.
($R^{ORD} 3.1$ and $R^{ORD} 3.3$ are also applicable.)

$CLAUSE_5$ —**parenth**→ $CLAUSE_6$: $R^{ORD} 15.1$ gives $CLAUSE_6 + CLAUSE_5$.
($R^{ORD} 15.2$ is also applicable.)

Two final orderings are as follows (the second one coinciding with sentence (49)):

$CLAUSE_3 + CLAUSE_1 + CLAUSE_2 + CLAUSE_4 + CLAUSE_6 + CLAUSE_5$

$CLAUSE_1 + CLAUSE_2 + CLAUSE_3 + CLAUSE_4 + CLAUSE_6 + CLAUSE_5$

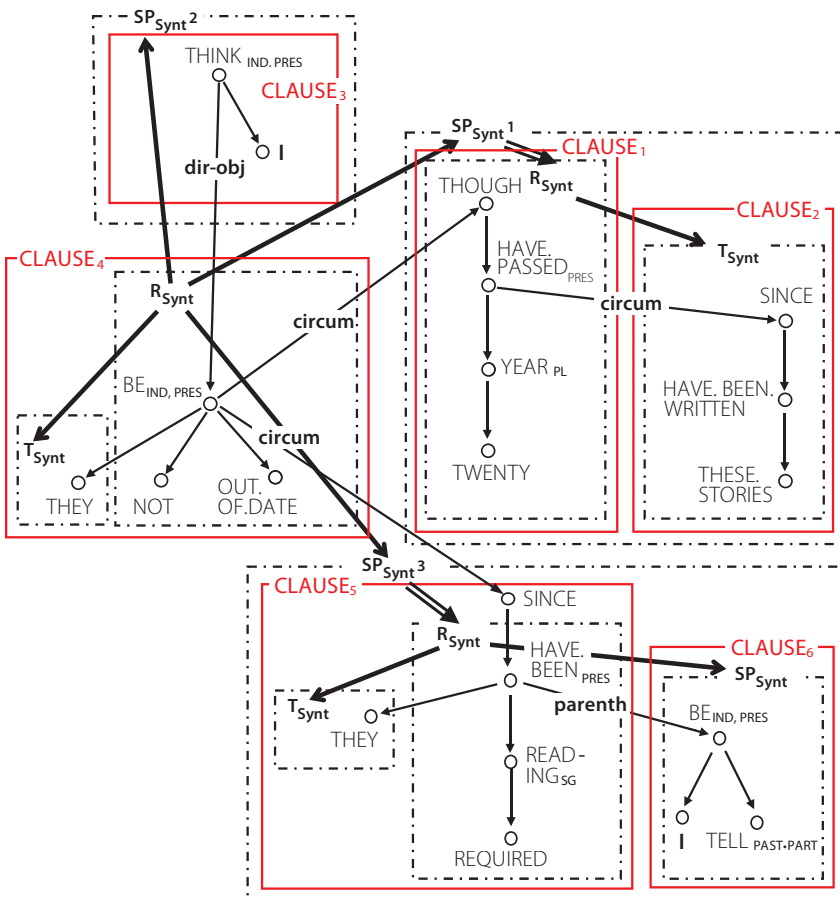


Fig. 9. A simplified surface-syntactic representation of sentence (49)

As one can see, the placement of circumstantial and parenthetical specifier clauses allows for considerable variance, some of it (more or less) free, and some under the control of several additional factors. Thus, two heavy specifiers are not welcome at the same edge of the sentence; a contextually-bound specifier is preferred at the beginning; a very light specifier is dispreferred at the end of the sentence; such phraseologized specifiers as, for instance, *what is even more surprising*, tend to be anteposed; etc. Further rules are required to take care of these cases.

7. Conclusions

Rounding up our exposition, we would like to attract the reader's attention to four important linguistic facts that our study has shed some light upon.

1. From the viewpoint of their linear placement, subordinate clauses are of two types: syntactically autonomous clauses, which are placed with respect to their superordinate clause as a whole; and syntactically non-autonomous clauses, placed with respect to a lexeme in their superordinate clause. A subordinate clause of the first type is a circumstantial clause, and it is introduced by a semantically full conjunction; its placement is determined by the Synt-Thematic structure of the sentence. For the placement of the second-type subordinate clauses the thematic structure of the sentence is much less relevant: syntax takes care of it.

2. As is well known, the syntactic and communicative organization of a sentence do not necessarily coincide; they need not even be isomorphic. But their divergence reaches its peak at the level of complex sentence: the borders of clauses frequently do not coincide with the borders of communicative – in our case, thematic – areas. A clause inside a complex sentence can constitute a whole thematic area, be a part of a thematic area, contain a thematic area, or be distributed between two thematic areas. This phenomenon essentially affects the ordering of simple clauses.

3. Along with the Theme and the Rheme, the Specifier proved to be a relevant Thematic notion.

4. Rules for ordering simple clauses within complex sentences are organized in three groups: local, quasi-local, and global, which corresponds to the organization of the rules for word order within simple clauses. This fact seems to indicate that the order of various components of the sentence is controlled by factors of “triple” nature, identical for wordforms, phrases and clauses.

As for the perspectives of further studies, two trends are obvious:

- On the one hand, developing and sharpening the description of each particular construction, covered by our rules. The linguistic phenomena that need to be accounted for include, in the first place, semantic considerations

- (different types of Circumstantials), other communicative categories (for instance, Givenness and Focalization), and heaviness of clauses.
- On the other hand, looking for better generalizations, trying to find a common shape for rules that deal with the ordering of words and phrases within clauses and for rules that work with clauses within complex sentences.

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