Types of negation in functional generative description: reading Eva Hajičová's "Negation and Topic vs. Comment"

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Structure of the Article[1]

1 Bracketed numbers refer to examples and representational structures of various types (cf. section 9 ff.). Small Roman numerals refer to constraints and rules. Bold capitals refer to inferential frames. The following abbreviations for technical concepts have been used (the numbers indicate the section in which they are introduced). *CD* (communicative dynamism): 5.4; *F-boundary* (focus boundary): 6.1; *F-template* (template containing F-boundaries): 6.3; *FGD* (functional generative description): 5; *FSP* (functional sentence perspective): 4; *FN-template* (template containing F- and N-boundaries): 8; *IF* (inferential frame): 9; *N-boundary* (scope of negation boundary): 7.1; *N-template* (template containing N-boundaries): 7.2; *SR* (semantic representation): 5.2.

 | DOI:10.1163/9789004417137_011

1 Introduction

The present paper serves a twofold aim.

Sections 2 through 12 contain an analysis of Eva Hajičová's work on negation and functional sentence perspective (*FSP*). They are intended to serve readers with a general knowledge of 20th-century formal linguistics who are conscious of the role that slavists and linguists from the Slavic nations have played in it, but may not be fully aware of the specific contribution of Petr Sgall's school of functional generative description (*FGD*), of which Hajičová is a major exponent.[2]

FGD is an endeavour to merge components from different schools that prospered in the 1960s and 1970s into a single consistent model of linguistic description. Besides classic Prague School FSP, the traditions that inspired FGD include the dependency syntax tradition that was sustained in both continental European and Soviet linguistics, as well as contemporary North American approaches to semantic representation and generative semantics. Hajičová's research on negation and FSP was regarded as one of the highlights of FGD. It was published three times: as a chapter of Sgall, Hajičová and Benešová 1973, as an article, viz. Hajičová 1973, and as a part of Hajičová 1975, which is Hajičová's doctoral dissertation.

2 See Panenová and Sgall 1995 for a survey of Hajičová's contributions to linguistic theory.

Hajičová's account makes no smooth reading even to readers versed in formal linguistics. It is therefore hoped that the analysis presented below, which includes a formalization using notational conventions that are more unified than Hajičová's original ones, may be helpful in grasping the concepts and methods used in FGD and appreciating their utility as a tool for analyzing negation.

Sections 13 through 17, on the other hand, are intended to take Hajičová's results on negation one step further. Besides proposing a few amendments, it is shown that FGD can be applied to work out a typology for the class of negative sentences that Hajičová has investigated, which is a prospect that has to the present writer's knowledge remained unexplored so far.

So as to enhance the clarity of our description of Hajičová's method, a few auxiliary concepts will be adopted, A notion labelled *stratification* will be introduced in 2.1 as an expository device, i.e. as a pre-theoretical, pragmatic notion, which facilitates discussing the meanings of negative sentences in pragmatic terms, i.e. without involving the logical concepts that formal linguists claim are part of those meanings. In other words, stratification is introduced as a meta-concept, to avoid circularity in describing Hajičová's method.

Furthermore, the concept of *inferential frame* is introduced in section 9 to capture Hajičová's practice of referring to hearer's inferences as triggered by utterances to distinguish the meanings of sentences.

Page references in the present exposition refer to Hajičová's 1973 article, which is practically identical to Chapter 4.1 of Sgall, Hajičová and Benešová 1973. Examples given by Hajičová and other cited authors have mostly been adopted without alterations. Hajičová mostly uses English examples, implying the assumption that negation is a universal phenomenon that manifests itself in essentially identical ways in different languages, at least in the type of sentences under investigation. Although this is not necessarily justified and some apparent cross-linguistic differences will be noted below, the question whether different languages require fundamentally different treatments will not be examined here. This paper contains a few examples from other languages besides English (Czech, Russian, Afrikaans) as they were brought in by the authors cited or because their surface structures illustrate relevant underlying phenomena in a more transparent way than English does.

2 Pragmatic Preliminaries

Negation is a fuzzy concept, which may refer to various patterns of language behaviour. To some linguists (e.g. Van Ginneken 1907, 199), negation is primarily a signal of resistance, i.e. serves Bühler's *signalling* (*Kundgabe*, *Ausdruck*)

function of language (cf. Bühler 1918, 1; Bühler 1934, 28). Others view negation as typical for Bühler's *social* (*Auslösung*, *Appell*) function, viz. as an instruction to a hearer to refrain from performing certain actions (ibid.). Most of the work done in the second half of the 20th century, however, concentrates on negation as a part of Bühler's third, *representative* (*Darstellung*), function of language (cf. Bühler 1922, 62), viz. as a set of instructions to the hearer to perform mental rather than physical action. In this *descriptive* or *narrative* mode of language use, a speaker instructs the hearer to think of objects and situations (*Gegenstände* and *Sachverhalte*; cf. Bühler 1934, 28) and to establish links and relationships between them without explicitly insisting on action. To the latter type of linguists, which includes Hajičová, negation is one of the tools that speakers (writers) use to manipulate their hearers' (readers') focus and beliefs by navigating them between representations of situations.

As a preamble to discussing the theory that Hajičová applies to descriptive and narrative negative utterances, it will be attempted to avoid descriptive circularity by providing a pre-theoretical description of the phenomenon of negation without using the theory. Here are some assumptions on what happens when a speaker or writer produces a descriptive or narrative utterance containing a negation.

2.1 *Stratification*

We shall start with our assumptions on what happens when a speaker utters a descriptive or narrative sentence that does not contain a negation. Consider sentence (1).

(1) Peter was GLAD.

Here, as in Hajičová's examples, capitals are used to mark the constituent that carries the prosodic stress, or as Hajičová calls it, the "intonation centre" (H81[3]). The convention of reducing the prosody of a sentence to marking just one item in just one way, which was current in formal linguistics, will not be called into question here.

A speaker (writer) who utters sentence (1) issues an appeal to the hearer (reader) to think of a *situation* or *event* that is characterized by Peter's being glad. But the sentence also implies another appeal. The use of the past tense in (1) implies that the hearer is invited to think of Peter's being glad as a characteristic of another situation, which is not, or not necessarily, the situation in which the sentence is uttered. More specifically, the speaker appeals to the hearer to imagine a situation *A* of Peter's being glad, and attribute this thought

3 This format will be used throughout this article to refer to pages in Hajičová 1973.

situation ***A*** as a characteristic to *another* situation ***A′***, which is to be thought of as existing at a point of time anterior to the speech situation.

As a general term for the practice of appealing to the hearer to think of (the characteristics of a situation and subsequently demote them to the position of characterizing another situation, the term *stratification*, which Ebeling coined for a similar concept (e.g. Ebeling 1978, 372), will be used below.

Tense markers are not the only device that enable the users of the language to assign a thought situation to another thought situation as a characteristic. Languages often have modal markers, which introduce relationships between situations that do not pertain to points or fragments on the physical time axis but to interlocutors' desires or expectations or other dimensions on which the human mind projects the properties of situations. Even past tense markers can be used to evoke situations that cannot be arranged on the physical time axis. When Dutch children play house, they often use the past tense instead of the present so as to make clear that they are staging a fictitious situation, in which they only play roles.

Negation, too, may be conceived of as a type of stratification. A negative judgement only makes sense when the correlative positive judgement has already been made or considered (Russell 1948, 138). When uttering a negative descriptive or narrative sentence, a speaker wants the hearer to consider two situations: the situation to be negated on the one hand and the situation which is characterized by the absence of the negated situation on the other. A negative sentence is thus an appeal to the hearer to think of situation ***A*** and to imagine *another* situation ***A′***, which is solely characterized by the absence of the situation ***A*** (cf. Ebeling 1994, 17), or rather by its being *different* from ***A*** (Russell 1948, 139). Sentence (2) below implies two instances of stratification: the situation of Peter's being glad is stratified both for time and for negation. The question which stratification comes first is left out of consideration here.

(2) Peter was not GLAD.

2.2 *Bisituational Sentences*

The sentences that Hajičová examines are more complex as they usually comprise an appeal to the hearer (reader) on the part of the speaker (writer) to think of two specified events or situations in relation to each other. This is the case in sentences (3) and (4).

(3) Peter was glad that they had COME.

(4) Peter was glad about their ARRIVAL.

The two situations are Peter's being glad about their arrival (***S***), and the arrival itself (***s***), which is referred to by a subordinate clause, as in sentence (3), or a deverbal noun, as in sentence (4). The speaker appeals to the hearer to think of situation ***s*** and use it as a building brick, i.e. as a feature that characterizes situation ***S***. It is proposed not to apply the term *stratification* here, as both ***S*** and ***s*** are specified separately. While ***S*** is fully amenable to stratification, the possibilities of stratifying ***s*** vary between (3) and (4), depending on the grammar of the language.

2.3 *Negation in Bisituational Sentences*

Hajičová's paper is basically about what happens when bisituational sentences such as (3) and (4) contain a negation. Consider her Czech example (5) (H81). The negation is expressed by the prefix *ne-* 'not' on the finite verb form *byl* 'was'.[4]

(5)	Petr	ne-byl	nadšen	tím,	že
	Petr.NOM	not-was	enthusiastic	PROCLAUSE.INS	that
	PŘIJELI.				
	arrived.3.PL				
	'Petr was not enthusiastic that they had come.'				

Here situation ***s*** of their arrival is a building brick of situation ***S*** of Petr's being enthusiastic about ***s***. The question arises which situations are stratified for negation, i.e. which situation or situations are presented by the speaker as characterizing a third situation as being different from them. Is the third situation characterized by the absence of Petr's enthusiasm, or by the absence of their arrival, or by the absence of both Petr's enthusiasm and their arrival, or, on the contrary, by the absence of neither situation (i.e. the presence of both)?

Hajičová observes that "[sentence (5)] corresponds to a situation when they "need not have come"" (H81). So the answer to the question whether the embedded situation ***s*** is stratified for negation hangs in the air.

Hajičová's observation is based on inspection of hearers' or readers' inferences. When hearing (5), a hearer may either infer that Petr's lack of enthusiasm was motivated by their arrival, or that it was motivated by their failure to arrive. As will turn out later, the hearer may even infer that Petr was in fact enthusiastic, only not about their arrival (which in turn may or may not have

4 The explicit subject *Petr* was inserted into Hajičová's example so as to facilitate reference to the subject when discussing the sentence. Glossing of the non-English examples is limited to morphological categories that are relevant to the discussion.

occurred). Hajičová never uses the term *inference* but since possible hearer's inferences are exactly what she assesses when analysing the meanings of sentences, it is convenient to introduce it here as a technical term. A descriptive sentence like (5) allows for different inferences, and a hearer or reader, when confronted with it, usually selects a specific one depending on the clues that are offered by the context and the setting in which (5) is uttered.

Hajičová confronts sentence (5) with (6) below. Here the order of the constituents of (5) is inverted: the subordinate clause about their arrival turns up at the beginning of the sentence.

(6) Tím, že přijeli, Petr ne-byl
PROCLAUSE.INS that arrived.3.PL Petr.NOM not-was
NADŠEN.
enthusiastic
'That they had come did not make Peter enthusiastic.'

According to Hajičová the meanings of (5) and (6) do not coincide (H81). When uttering (6), the speaker makes sure that the hearer infers that their arrival actually occurred and that Petr was not enthusiastic about it. By evoking situation ***s*** before evoking ***S***, the speaker gets across that ***s*** must be thought of as having actually occurred, i.e. is exempt from the negation stratification of ***S*** that is prompted by the verbal prefix *ne-*.

So both the constituents and the syntactic relations in sentences (5) and (6) are identical but nonetheless convey different meanings, assuming that sentences that correspond to different sets of possible inferences do have different meanings. Apparently, the lexical semantics of the constituents and the syntactic relations that hold among them do not exhaustively account for all aspects of the meaning of a sentence. It is up to formal semantics to develop devices that take care of the residual elements: Hajičová intends to show that functional generative description, by employing the so-called "scale of communicative dynamism" fulfils this task. This concept will be dealt with in 5.4.

Hajičová assumes that English behaves like Czech in all relevant aspects. She ascribes the ambiguity that characterizes sentence (5) to the English sentence (7) as well, while she considers such ambiguity to be absent in an English counterpart (8) of sentence (6) (H81).

(7) He was not glad that they had COME.

(8) That they had come did not make him GLAD.

Native speakers of English consulted by the present writer hesitated about Hajičová's observation: they felt that, under all circumstances, sentence (7) implies that the arrival occurred.

This does not necessarily affect the issue. On H85, Hajičová discusses English bisituational sentences containing a negation in which the embedded situation ***s*** is not expressed by a subordinate clause but by a noun, as in paraphrase (9) of sentence (7).

(9) Peter was not glad about their ARRIVAL.

Here the ambiguity about situation ***s*** actually having occurred is not removed. In sentence (9) the arrival may have failed to occur.

Then again, some native speakers consulted by the present writer doubted whether moving *their arrival* to the front, as in sentence (10), fully removes the ambiguity.

(10) Their arrival did not make Peter GLAD.

So English surface constituent order may not seem to affect the ambiguity that Hajičová signals in quite the same way and to the same extent as Czech surface constituent order. More particularly, the definiteness of the arrival as implied by the possessive pronoun *their* in the English sentence is likely to be a factor to be taken into account (cf. section 17). Nonetheless it is proposed to accept Hajičová's assessment of the grammaticalness of the English sentences at face value. We can afford to do so because surface word order will in the end turn out to be irrelevant: as we shall see in 5.4, the relevant element order that determines possible inferences is the one in the "scale of communicative dynamism", which does not necessarily coincide with surface word order.

3 Negation in Linguistic Theory

Before introducing FGD and communicative dynamism, Hajičová explores existing ideas on handling negation in the formal representation of a sentence. She turns to current North American generative theory, especially generative semantics.

3.1 *Sentence Negation and Constituent Negation*

Hajičová's starting point is Chomsky 1957, 65–67, where negation is regarded as a syntactic transformation of an underlying affirmative kernel sentence. At

that stage of the development of generative grammar, transformations do not necessarily affect the meaning of a sentence, but some do. The transformation that turns an underlying affirmative sentence into a negative surface sentence is a case in point. The affirmative Russian sentence (11), for example, is transformed into the corresponding negative sentence (12) by inserting the negative particle *ne* 'not'.

(11) Petr bojalsja IVANA.
Petr.NOM feared Ivan.GEN
'Petr feared Ivan.'

(12) Petr ne bojalsja IVANA.
Petr.NOM not feared Ivan.GEN
'Petr did not fear Ivan.'

It turns out, however, that negation cannot be captured by a single standard rule. Compare sentence (12) with sentence (13).

(13) Petr bojalsja ne IVANA.
Petr.NOM feared not Ivan.GEN
'Petr did not fear Ivan', meaning 'it was not Ivan that Petr feared'.

Sentence (12) and sentence (13) are not interchangeable. By using (12), the speaker appeals to the hearer to think of a situation ***A***′ that is characterized by the absence of situation ***A*** of Petr's fearing Ivan as conjured up by (11). In sentence (13), the speaker also conjures up situation ***A***′ through ***A*** but *in addition* invites the hearer to think of yet another, parallel, situation ***B*** that is similar to situation ***A*** as conjured up by (11) and even shares some of its participants but is not stratified for negation. The hearer of (13) is expected to infer that Petr does not fear Ivan (i.e. ***A***′) but does fear someone or something else (i.e. ***B***).

Klima uses the terms *sentence negation* (Klima 1964, 270ff.) and *constituent negation* (e.g. Klima 1964, 307) to refer to the difference between (12) and (13). In his view, negation implies the introduction of a single negative element, which may turn up in different places in the structure of the sentence: depending on its location, the element serves to signal either sentence negation or constituent negation while marking which constituents are negated (H81; cf. Klima 1964, 295ff.). The resulting distinctions happen to surface in the Russian sentences (12) and (13) but may remain covert elsewhere and in other languages.

3.2 *The Scope of Negation and Its Complement*

Hajičová discusses the question how the difference between (12) and (13) must be accounted for in a formal linguistic representation of the sentence.

One option is to assume, for each negative sentence, some kind of semantic representation that is independent from its syntactic representation and registers its division into two parts, as "determined" by the negative element (the negative "operator").

Hajičová refers to one of the parts of the dichotomy as its *scope of negation*. Only when discussing Chomsky's views, Hajičová adopts his terminology and refers to the scope of negation as its *focus* (H82). This is better avoided as elsewhere she uses the term *focus* as a synonym of *comment* (e.g. H91–92).

When describing Chomsky's and Jackendoff's views on negative sentences, Hajičová adopts Chomsky's term *presupposition* to refer to the part of the sentence that is outside the scope of negation (H82) but she avoids using the term elsewhere in the paper. This makes sense as *presupposition* is a concept with a complex history, which Hajičová extensively discusses in another paper published in the same period (viz. Hajičová 1974).[5] As we cannot afford to discuss presupposition here but do need a term to refer to the elements of a sentence that are outside the scope of negation without adding to the confusion, the theoretically neutral term *complement* will be used below. Note, furthermore, that the complement of the scope of negation in a sentence does not coincide with what is called its *pragmatic presupposition* in Crockett 1977 and will be discussed in section 15 of the present paper.

In non-theoretical terms, the scope of negation comprises the constituents that *uniquely* characterize the situation to be stratified for negation (i.e. ***A***), whereas the constituents that the negated situation shares with the situation that the speaker invites the hearer to assign to the non-negated parallel situation (i.e. ***B***) make up its complement. Thus, in sentence (13), whereas *Ivana* belongs to the scope of negation because Ivan takes part in the negated situation only, the constituents *Petr* and *bojalsja* 'feared' belong to the complement because they identify participants in both the negated situation ***A*** and the parallel non-negated situation ***B***.

What exactly comprises the scope of negation in the case of sentence negation, as in (12), is subject to discussion. It may be argued that the complement is empty: the whole situation that the speaker conjures up is stratified for negation. It may also be argued that, in the case of sentence negation, the agent, i.e.

5 Cooper 1974 is another, most enlightening source on the discussion on presupposition in the 1960s and 1970s.

Petr in (12), represents the complement, as his not taking part in the negated situation does not block his participation in any other situations. Hajičová apparently subscribes to the latter viewpoint: in her examples, the complement is never empty (see 7.1). In one instance, Hajičová adduces the inferred *existence* of a participant as a reason for assigning it to the complement of a negation, or at least keeping it outside the scope of negation (see 11.2). Agents are only found in the scope of negation if other constituents are found in its complement, as in sentence (14).

(14) Ivana ne bojalsja PETR.
Ivan.GEN not feared Petr.NOM
'Petr did not fear Ivan', i.e. 'Peter was the one who did not fear Ivan'.

3.3 *Logical Representation vs. Deep Structure*

One way of integrating the scope of negation division in the formal representation of a sentence is by assuming a level of representation that takes care of its *logical semantics*, which includes quantification and negation, as opposed to what is referred to as the *lexical semantics*, which is assigned to the deep structure. In the logical representation, the *operator of negation* determines what is negated, using brackets when necessary to specify the scope of negation. A set of correspondence rules is required to land the operator and its scope markers in the required positions in the linear surface structure. In the case of constituent negation as in the Russian sentence (13), the negative signal surfaces as *ne* 'not' in front of the scope of negation. Sentence negation, on the other hand, is signalled by *ne* in front of the finite verb, as in sentence (12).[6] Jackendoff and Chomsky advocated assigning such logical meanings directly to the surface structure in this way (H82; cf. Jackendoff 1969, 234–241, Chomsky 1971 (1970), 207–209).

Another way of accounting for the difference between (12) and (13) is to encode the scope of negation in the deep structure of a sentence, along with the other semantic markers. This approach is suggested in Katz and Postal 1964, 73–74 and worked out in McCawley 1976 (1970) and Lakoff 1971, 243ff. These authors see no need for a separate logical representation: in a transformational grammar, the position of the negative signal may mark the scope of negation in the underlying kernel sentence. The syntactic rules that transform the ker-

6 Note that sentences (12) and (13) are only presented here for the purpose of exposition. Considered in isolation, they present an incomplete picture of the Russian situation. Sentences like (12), with *ne* preceding the verb, are not *exclusively* used to express sentence negation: they may also render instances of constituent negation (cf. Crockett 1977, 234–235).

nel into the surface structure must, then, ensure the appropriate landing of the negative signal (H82).

This approach requires that all the semantic material of a sentence be embryonically represented in the kernel sentence. In that case, transformations are supposed to preserve meaning (H81, referring to Partee 1971): there is no room for optional rules that affect the meaning of a sentence.

This does not warrant that the resulting linear surface structures are unambiguous. In the case of negation, syntactic constraints may reserve only a limited number of surface positions for negation signals, causing sentences with different underlying scopes of negation to coincide at the surface. The rules of English syntax (or at least in the unmarked literary style that avoids extraction) sometimes provide just a single surface position for the negation marker, regardless of the scope of negation. The deep divisions underlying sentences (12) and (13) in Russian underlie just a single English sentence (15).[7]

(15) Peter did not fear IVAN.

As to the examples in Hajičová's introduction, postulating a scope of negation division in the kernel could contribute to explaining why sentence (5) is ambiguous while sentence (6) is not. The surface position of the single negative signal enables the hearer or reader to identify the beginning of the scope of negation but not the end. The scope of negation in sentence (5) may either extend to the rest of the sentence, implying that the situation of Petr's being glad about their arrival is negated, or stop at *nadšen* 'enthusiastic', implying that just his being enthusiastic is negated. The syntactic rules do not take care of marking the end of the scope of negation.

In this respect, Czech and other European languages differ from Afrikaans, which has an overt *scope marker* indicating the end of the scope of negation (Waher 1978, 64–65). Compare sentences (16) and (17) from Waher 1978, 142, in which the second occurrence of *nie* 'not' marks the end of the scope. Sentence (16) is likely to imply that his being paid was no reason for doing it. Sentence (17) implies that his being paid was the reason for not doing it.

(16)	Hy	het	dit	nie	gedoen	omdat	hy	BETAAL	is	nie.
	he	has	it	not	done	because	he	paid	is	nie_2
	'He did not do it because he was paid'									

7 Note that many observations in Hajičová's paper are contingent on a notational convention that allows marking only one item in a sentence in only one way for prosodic stress. A more sophisticated system might reveal that this convention conflates different ways of stressing the last constituent of (15), which correspond to different scopes of negation.

(17) Hy het dit nie gedoen nie omdat hy BETAAL is.
he has it not done nie_2 because he paid is
'He did not do it because he was paid'

As we saw, Czech may resort to permutation to secure unambiguous scope marking. By placing, in sentence (6), the constituent that refers to the embedded *s* situation, i.e. *tím, že přijeli* 'that they had come', before the signal *ne-* that marks the beginning of the scope of negation, speakers of Czech may make sure that it is interpreted as a part of the complement.

Given the observed difference between sentences (5) and (6), the approach put forward by Jackendoff and Chomsky requires two concurrent systems of rules for determining surface word order: the rules that secure the correspondence of the logical semantic representation with the surface structure on the one hand, and the classic syntactic rules of the transformational component dealing with the lexical semantics of the sentence on the other. In the approach developed by Katz and Postal, McCawley and Lakoff, on the other hand, the syntactic component is solely responsible for surface constituent order, processing all semantic factors as registered in the kernel sentences. The simplicity criterion for dealing with linguistic facts favours the latter approach, which is probably the reason why Hajičová favours it (H81). An additional argument supporting her choice will be discussed in 9.1.

3.4 *Negation and Prosodic Stress*

Manipulating the linear arrangement of constituents is not the only way to mark the scope of negation division in the surface structure of a sentence. Hajičová (H82) adduces examples from Bach 1968, 97, which suggest that a speaker may also resort to prosody to identify the scope of negation. Consider Bach's sentences (18) and (19).

(18) The professors didn't sign a PETITION.

(19) The PROFESSORS didn't sign a petition.

A speaker may use sentence (19) to insist on the inference that, while it is true that others signed a petition, it is not true that the professors did so. The prosody overrides the linear arrangement of the constituents in marking the scope of negation.

This observation brings the issue home to Prague. Starting in the late 1920s, Prague linguists taught us that, besides constituent order, prosody is an important device for rendering the *functional sentence perspective* of a sentence,

which determines its *topic-focus division*, as will be clarified in 4.1.[8] It is not a coincidence that the idea of exploring the possible relationships between the topic-focus division on the one hand and the scope of negation division on the other was conceived in Prague.

4 Functional Sentence Perspective (*FSP*)

Functional sentence perspective (*FSP*) is the term used to refer to the strategies that speakers use to land a message effectively in the hearers' (readers') frames of reference. There is an enormous literature on FSP. This is not the place to treat it in depth[9] but a few words must be devoted to the basic units that are applied to describe the FSP of an utterance, viz. its *topic* and *focus*.

4.1 *Topic and Focus*

As a hasty characterization of topic and focus, it may be suggested that, in as far as an utterance is an effort on the part of a speaker to apply a mutation in the frame of reference (knowledge, attitude, behaviour, attention focus) of the hearer, the topic reflects the speaker's effort to land the change onto the right spot in the hearer's frame of reference, while the focus specifies the content of the intended change.

The various ways in which the topic-focus division of a sentence may manifest itself at the surface include constituent order and prosodic stress. The Russian sentence (20) reflects the "neutral" word order of a sentence, in which the speaker declares his intention to write someone a letter.

(20)	Zavtra	ja	emu	napišu	PIS'MO.
	tomorrow	I.NOM	he.DAT	write.PFV.PRS	letter.ACC
	'I am going to write him a letter tomorrow.'				

While the exact division of sentence (20) into its topic and its focus would require some discussion, it is likely that *zavtra* 'tomorrow' belongs to the topic and at least *pis'mo* 'letter' belongs to the focus, i.e. conveys information that is new to the hearer.

In sentence (21) (from Adamec 1966, 20), the constituent order, with *zavtra* in sentence-final position, makes sure that the act of writing the letter is inter-

8 See H83 for references to relevant work by exponents of the Prague School.

9 The reader is referred to Keijsper 1985 for a thorough analysis of *FSP*.

preted as the topic of the sentence: the speaker assumes that the thought of the action and its participants is already present in the hearer's frame of reference and only needs to be pointed to. The focus, i.e. the intended mutation in the hearer's frame of reference, is the time of the writing of the letter.

(21) Pis'mo ja emu napišu ZAVTRA.
letter.ACC I.NOM he.DAT write.PFV.PRS tomorrow
'I am going to write him a letter tomorrow', i.e. 'it is tomorrow that I shall write him a letter.'

As an example of the role of prosody in determining the topic-focus division consider sentences (22) and (23), which are the affirmative counterparts of (18) and (19) respectively.

(22) The professors signed a PETITION.

(23) The PROFESSORS signed a petition.

In (23), the prosodic stress on *professors* overrides constituent order in marking the focus: the speaker is convinced that the hearer is already focussed on the fact that a petition was signed, but wants to bring the fact that it was the professors who signed it under his attention.

A few terminological remarks may be in order here. *Functional sentence perspective* is considered to render Czech *aktuální větné členění* and Russian *aktual'noe členenie predloženija*. The conceptual pairs *topic-focus*, *topic-comment*, *theme-rheme*, *given-new*, *basis-nucleus* (Czech *východisko-jádro*; Russian *osnova-jadro*) and *psychological subject* vs. *psychological predicate*, as used by linguists of various epochs and theoretical convictions, will be treated as synonymous here. Although the term *comment* occurs in the title of Hajičová 1973, she uses *focus* for the same concept in the article itself, e.g. on H91–92. When describing the views of other linguists, Hajičová maintains their use of *theme* and *rheme* (H82–83).[10] Finally, Hajičová introduces the distinction between *contextually bound* and *contextually non-bound* segments to refer to what virtually coincides with the topic-focus distinction. We shall deal with contextual boundness in 5.5.

10 As we saw in 3.2, Chomsky's terminology for the articulation of a negative sentence into its *presupposition* and its *focus*, where *focus* refers to the scope of negation, is maintained in Hajičová's discussion of Chomsky's and Jackendoff's views on H82.

4.2 *Topic-Focus Division vs. Scope of Negation Division*

So there are two ways of articulating a negative sentence: it may be divided into its topic and its focus, and into its scope of negation and its complement. The question to be dealt with is whether the two divisions are independent of each other.

In the cases investigated by Hajičová, both divisions appear to be marked by the same devices, viz. constituent order and prosodic stress. (Other means of focus marking, such as particles, extraction, passive transformation, etc., are left out of consideration, at least in Hajičova 1973.) Consequently, overlapping and entangling can be expected. Take Bach's sentence (19): here *the professors* is both its focus and its scope of negation. In the scope of negation analysis, stressing *the professors* makes sure that the fact that a petition was signed is not denied; in the topic-focus analysis stressing *the professors* is an appeal to the hearer's awareness of the idea of a petition having been signed. Is this homonymy or are we dealing with manifestations of a single phenomenon?

Hajičová decides that an insightful analysis of negation presupposes a thorough analysis of its relations with topic-focus articulation. While Hajičová's paper deals with a number of issues simultaneously, the question that turns out to underlie most of her observations is the following: knowing the topic-focus division of a sentence containing a negation, to what extent is it possible to predict which constituents fall into the scope of negation?

5 Hajičová's Theoretical Framework: Functional Generative Description (*FGD*)

Before dealing with Hajičová's results, the linguistic objects to which topic-focus articulation and negation articulation are applied must be identified. This requires an insight into the theoretical framework that she uses, viz. Petr Sgall's *functional generative description* theory (*FGD*, *Funkční Generativní Popis*).[11]

As we shall see presently, FGD shares various characteristics with other formal approaches that dominated linguistics in the mid twentieth century.

5.1 *Multilevel Representations of Sentences*

Sgall's linguistic objects are multilevel representations of sentences (H83). The lowest level is the phonetic representation of a sentence; the highest or *tec-*

11 There is a considerable literature on FGD. For details and references on the state of the art in the 1970s, the reader is referred to Sgall, Hajičová and Benešová 1973.

togrammatical level represents its meaning. So-called *transduction rules* convert representations of a given level into those of the next lower level.[12] In this respect, Sgall's theory closely resembles the *Meaning ⇔ Text Model*, on which Mel'čuk and other Soviet linguists were working in the same period (e.g. Mel'čuk 1974).

5.2 *The Tectogrammatical Level or Semantic Representation (SR)*

The representations on the tectogrammatical level of FGD are generated by a *calculus*, i.e. a finite set of permissions in the sense of Apresjan that allows specifying a non-finite set of structures.[13] In this respect, FGD is a variety of generative grammar, which is also a calculus, a device that generates and characterizes the elements of the non-finite set of grammatical sentences of a language.

The tectogrammatical representation of a sentence is also called its *semantic representation* (*SR*): as Hajičová notes on H83, Sgall's theory not only resembles generative semantics but in fact anticipated it, having been developed in the early 1960s. In FGD, the English sentence (15) is matched by at least two different SRs, depending on whether it is intended to convey the appeal to the hearer that is conveyed by the Russian sentence (12) or the appeal conveyed by Russian (13).

5.3 *The Format of Semantic Representations*

The format of Sgall's semantic representations, however, is different from the format used in generative semantics. In North-American generative grammar, the relations that hold among the constituents are represented as immediate constituent structures; in a semantic representation in Sgall's FGD, on the other hand, the relations among the constituents are expressed by two matching structures, viz. a *dependency structure* (i.e. tree), and a *linear structure* (i.e. a string).

5.3.1 Dependency Structure

In East and continental European linguistics, dependency structure was a popular alternative to immediate constituent structure for expressing the syntactic characteristics of a sentence. Dependency structure diagrams are found in the late 19th century in Kern's grammar of German (Kern 1884, 30–36) and

12 Hajičová provides numerous references to the relevant literature in footnote 3 on H83.

13 Apresjan distinguishes two types of rule in linguistic theory: the rules of a *calculus* are to be read as permissions (*razrešenie*, *pozvolenie*); the rules of an *algorithm* are to be read as instructions (*prikaz*, *komanda*) (Apresjan 1966, 107–108).

Tiktin's grammar of Romanian (Tiktin 1893, 126–129). Tesnière developed dependency syntax in the 1930s after seeing them used in Soviet school textbooks (Tesnière 1966², 15), where their use was probably inspired by Peškovskij, whose Russian syntax contains a couple of dependency diagrams (starting in the third edition: Peškovskij 1928³, 48, 57). In Czechoslovakia, Šmilauer introduced dependency analysis at least as early as the 1940s (Šmilauer 1947, 415–425). Starting in the 1950s, dependency analysis was applied in automatic translation research (see Ihm and Lecerf 1963 for references). Dependency structure is also the format of the representations on Mel'čuk's syntactic levels (but not on his semantic level) (cf. Mel'čuk 1974, 268ff.).

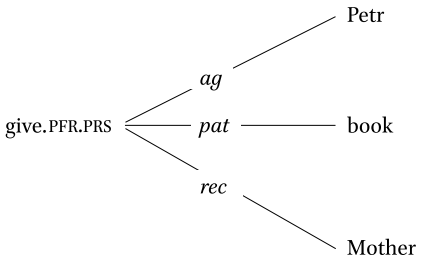
Depending on a linguist's precise choices, the dependency structure of the Russian sentence (24) below may look like figure (25).

(24)

Petr	dast	mame	knigu.
Petr.NOM	give.PFV.PRS	Mother.DAT	book.ACC

'Petr will give Mother a book.'

(25)



In most varieties of dependency linguistics, the verb component is the head (root) of a structure. The branches are labelled for what Hajičová calls the *participants* (H87), i.e. *arguments* or *adjuncts*, of the verb. They mark the roles that they play in the situation to be conjured up by the speaker: *ag* stands for the agent of the action expressed in the verb component; *pat* for its patient; *rec* for the person or object to which the action is directed; *caus* for the cause of the described event; etc. These roles are, in principle, independent of any morphological case marking: in sentence (11) through (13), a verb-specific rule puts the patient *Ivana* 'Ivan' in the genitive; in passive sentences, the patient ends up in the nominative and becomes its grammatical subject but remains the patient of the action. The precise definitions of these roles and the criteria for assigning them have given rise to a great deal of discussion, especially since Fillmore 1968. No effort will be made to justify role assignment in the examples given in the present exercise.

Like immediate constituent structures, dependency structures can be generated by a calculus (cf. Hays 1964). The two types of structure are not fully convertible: immediate constituent structure and dependency structure impose different constraints on the relations among the constituents of a sentence (cf. Padučeva 1964).

5.3.2 Linear Structure

In each SR, Sgall's dependency representation is matched by a linear representation. The linear representation of (24) is rendered in (26).

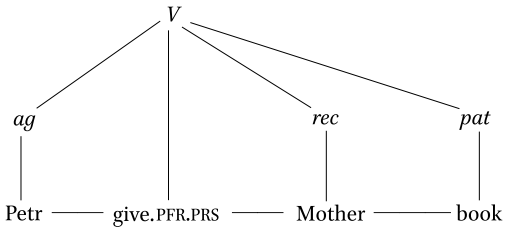
(26) Petr — give.PFV.PRS — Mother — book

The linear structure of an SR does not necessarily coincide with its surface word order. We shall return to this point in 5.4.

5.3.3 Recording Matching Dependency and Linear Structures

In a complete SR, a dependency structure is plotted on its linear structure. Figure (27) illustrates this format for sentence (24).

(27)



Hajičová does not normally present SRs in this format. For typographical convenience, she uses a linear representation in which the dependency structure is marked by means of brackets: bracketed constituents depend on non-bracketed ones (H86).

Thus, the SR for sentence (24) that is denoted in (28) is identical to the one rendered in Figure (27). As in Hajičová 1973, subscript labels on the constituents mark the roles of the corresponding branches of the dependency structure.

(28) [(Petr)$_{ag}$ give.PFV.PRS (Mother)$_{rec}$ (book)$_{pat}$]

Hajičová's bracketing convention is subject to limitations in that it can only handle SRs in which the dependency branches do not get entangled when

they are mapped on the linear arrangement of the constituents, i.e. as long as they are *projective* (cf. e.g. Ihm and Lecerf 1963, 7–11). As we shall see in 6.4, this is not guaranteed: Figure (56) shows a non-projective SR.

5.4 *Communicative Dynamism* (*CD*)

In SR (28) the linear structure of the semantic representation coincides with the linear arrangement of the constituents in the surface structure of sentence (24). This is not necessarily the case. The linear arrangement of an SR has a specific ontological status, which is not found in any other theory. It represents the *communicative dynamism* (*CD*) of the sentence (H83).

The introduction of an FSP-driven linear arrangement of the constituents in an SR is an interesting innovation of the Prague School legacy. Whereas topic and focus impose a binary division on an SR, CD imposes a sliding scale: the constituents of a sentence are ranked according to:

> [...] the extent to which the sentence element contributes to the development of the communication, to which it "pushes the communication forward", as it were. (Firbas 1964, 270)

In other words, the constituents are ranked according to the degree in which the speaker assumes the information to be conveyed by them to be new to the hearer. Hajičová assumes that:

> [...] with each type of participant of the verb, it is possible to determine its position in the systemic arrangement of the participants according to their CD. (H84)

In the SR of a sentence, the constituent with the highest degree of "newness" is found in the rightmost position of the CD scale.

The left-to-right direction of increasing communicative dynamism in an SR is a convention. As it happens, it matches the most frequent surface constituent order in neutral written Czech and Russian and, to various extents, other European languages as well. The "newest" information is commonly found at the end of a sentence.[14] Moreover, the order of increasing newness corresponds to the rising intonation pattern that characterizes narrative and

14 Hajičová's paper contains a few statements on "deep" word order. She posits a deep verb-subject-object order (*VSO*) for Czech, while the subject may turn out to be sentence-initial in deep English word order (H84). The relevance of her statements to the issue at hand is not clear to the present writer.

descriptive sentences (Kovtunova 1967, 115ff.) in the "neutral" style of those languages. In the majority of Hajičová's examples, the scale of communicative dynamism is identical with the linear order of the constituents in the surface representation. Cf. all examples discussed so far, except (19) and (23).

When assigning focus status to constituents that would not normally have it in narrative and descriptive discourse, a speaker has two strategies at his disposal (Kovtunova 1967, 122ff.). If, in the message conveyed in sentence (20), a speaker decides that the date of writing the letter is the constituent that he wants to change the hearer's mind about most, he can either retain the prosody while moving *zavtra* 'tomorrow' to the stressed final position to produce sentence (21), or leave *zavtra* in place while moving the prosodic stress there, as in sentence (29).

(29) ZAVTRA ja emu napišu pis'mo.
tomorrow I.NOM he.DAT write.PFV.PRS letter.ACC
'I am going to write him a letter tomorrow', i.e. 'it is tomorrow that I shall write him a letter.'

The order of the constituents on the CD scale of sentence (21) coincides with the surface constituent order of the sentence. For sentence (29), however, the arrangement of the constituents in the CD scale and their order in the surface structure will diverge. Until further notice (cf. 6.3 and 10.1), the linear arrangement of the constituents in SR (30) represents a plausible CD for sentence (29).

(30) [(I)$_{ag}$ (he)$_{rec}$ write.PFV.PRS (letter)$_{pat}$ (tomorrow)$_{temp}$]

SR (31) is a plausible representation of the meaning of sentence (23): the brackets render the dependency structure, while the linear arrangement renders the CD. The constituent (the professors)$_{ag}$ occupies the rightmost position, even if it is in the leftmost position in the surface structure of (23).

(31) [(a petition)$_{pat}$ sign.PST (the professors)$_{ag}$]

The linear CD arrangement of the constituents in the SR of a sentence is more convenient to analyse than the surface order. It has enabled Hajičová to avoid complications that arise when analysing sentences with deviating prosodic arrangements (at least to a certain extent, see 6.4). Another complication that is solved by investigating CD rather than surface constituent arrangement is the habit of putting adverbs of place and time in final position in the surface word order irrespective of their position on the CD scale, which is peculiar to

neutral written English (Hajičová 1975, 146–147). Sentence (32), which is the English counterpart of (20), is a case in point.

(32) I am going to write him a letter tomorrow.

Here *tomorrow* is found at the end of the surface sentence while it is more likely to end up somewhere near the beginning of the CD scale of (32).

Hajičová occasionally discusses non-neutral prosodic arrangements (e.g. sentence (85) in section 9). The conditions that prompt a speaker's choice between focus marking by means of "special" surface order and focus marking by means of prosodic stress must eventually be accounted for in a linguistic representation but will not be dealt with here.

5.5 *Contextual Boundness*

After substituting the sliding CD scale for the traditional binary topic-focus division, Hajičová reintroduces a binary division on that scale. Every SR can be split into what she calls its *contextually bound* left-hand segment and its *contextually non-bound* right-hand segment (H84).

Contextual boundness is presented as a self-evident notion. Contextually bound constituents include objects assumed to be known to the hearer from the preceding context or the setting of the utterance, but also "relatively general determinations [... marking] the local or temporal setting" (H84). At the end of her paper (H91), Hajičová introduces a so-called *performative hypersentence* as a heuristic device for detecting the topic and the focus of a sentence. This is a standard format for paraphrasing a sentence. Sentence (33) is an example.

(33) I say about *X* that *Y*.

When applied to sentence (23), performative hypersentence (33) yields sentence (34), which indicates that the signing of the petition constitutes the topic while the professors make up the focus.

(34) I say about the signing of the petition that the professors did it.

The adequacy of performative hypersentences will not be discussed here. More sophisticated approaches appear in Hajičová's later work (all the way up to Hajičová 2013).

At the end of the article under discussion, Hajičová makes clear that the contextually bound and contextually non-bound segments in an SR coincide with its topic and focus, respectively (H91). This view, too, is revised in her later

work, e.g. in Hajičová 2013, 537ff. But in the present analysis, any difference can be ignored: the terms *topic* and *focus* will be used throughout as synonyms of contextually bound and contextually non-bound segments.

5.6 *A Template for the Class of Sentences under Investigation*

Hajičová's substitution of SRs for surface structures and her exclusion of non-projective SRs from the analysis leave a well-defined class of SRs to be investigated, viz. those fitting template (35).

(35) $[(A_1) \ldots (A_i)\ V\ (A_{i+1}) \ldots (A_n)]$

Here V stands for the constituent containing the finite verb (e.g. *scolded*, *was glad*, *came*). A_j, where $j \geq 1$ and $j \leq n$, represents a constituent that depends directly on V in the dependency structure and occupies the j-th position on the CD scale.

In all of Hajičová's examples, $n \geq 2$: each sentence contains a finite verb that dominates at least two arguments. Template (36), where $n = 2$, contains three constituents: the verb and two arguments. SR (31) is an instance of template (36).

(36) $[(A_1)\ V\ (A_2)]$

SR (37), which is a likely SR for Hajičová's sentence (38), is an instance of template (39), where $n = 3$.

(37) [(Mother)$_{ag}$ scold.PST (her daughter)$_{pat}$ (her bad marks)$_{caus}$]

(38) Mother scolded her daughter BECAUSE OF HER BAD MARKS.

(39) $[(A_1)\ V\ (A_2)\ (A_3)]$

Prepositional phrases and subordinate clauses may fulfil constituent roles, e.g. (her bad marks)$_{caus}$ representing *because of her bad marks*, or (his wife was ill)$_{caus}$ representing *because his wife was ill*. Such causal adjuncts occur in most of Hajičová's examples as they occur in bisituational sentences, i.e. the type that prompted the problem that Hajičová set out to deal with. The cause of a situation ***S*** can be viewed as another situation ***s***. In (38), situation ***S*** is Mother's scolding her daughter, while *her bad marks* here imply a situation or an event ***s*** involving the marks that was the reason for the scolding. Other conjunctions, like *whenever* and *as far as*, may also mark bisituational sentences.

6 The Topic-Focus Division in the Semantic Representation

As we saw above, the topic-focus division is imposed on SRs (as *contextual boundness* division), not on surface sentences. As we shall see below, a single surface sentence may correspond to various SRs, each with a different topic-focus division.

6.1 *Focus (F-)Boundaries*

Hajičová marks the constituents that belong in the topic, i.e. the contextually bound constituents, with a superscript ^{b} (H86).

If the topic-focus articulation of a sentence were independent from the other structural properties of an SR, each constituent could be either bound or non-bound, independently of the others. For sentences consisting of 3 constituents, i.e. where $n = 2$, as in template (36), this would produce the $2^3 = 8$ different technically possible topic-focus assignment patterns. A four-constituent sentence would yield $2^4 = 16$ technically possible articulations, etc.

By substituting SRs for surface sentences, however, Hajičová reduces the number of possible templates. To start, Sgall's convention of rendering CD in an SR by means of linear constituent order and Hajičová's distinction between contextually bound and non-bound constituents make sure that all constituents that belong to the topic precede those belonging to the focus.

This implies that it is not really necessary to mark individual constituents for topic or focus. It is sufficient to indicate in each SR where the topic ends and the focus begins. The (*initial*) *F-boundary* that marks the beginning of the focus in an SR will be denoted with a labelled vertical line: $|^{F}$. Until further notice (i.e. 13.1), it will be assumed that there is only one F-boundary in an SR.

6.2 *Preset Constraints on the Position of an F-Boundary*

As we shall see, Hajičová's method consists in identifying limitations on the positions of borders and constituents in an SR with a view to be able to eventually predict the scope of negation of a negated sentence.

The theoretical framework and denotational conventions may entail limitations on the freedom of placement of the boundary signals in the CD scale in an SR.

The linear arrangement in an SR, for example, reflects a ranking of constituents according to the degree of their newness. If contextual boundness imposes a split on the CD scale into a topic and a focus, the end of the focus is bound to coincide with the end of the SR.

In other cases, limitations on the freedom of placement of the boundary signals result from the adopted notational conventions. Thus, the linear format

of the SRs that has been introduced in 5.3.3 renders it impossible to apply topic-focus analysis to non-projective SRs (see also 6.4).

Expressing such limitations does not add anything to our knowledge: the limitations follow on naturally from the choices of the investigator rather than from the linguistic facts. Yet it may be helpful to make them implicit in the form of reminders, so as to prevent their being "discovered" in the course of the procedure.

Here is a list of such *preset constraints* that apply to the topic-focus division of a sentence and have been identified so far. The term *preset* is intended as a warning that the constraints are not presented as outcomes of empirical observation. They either follow on from the descriptive framework, or apply to the complete class of investigated sentences as a result of the exclusion of sentence types to which they do not apply. As we shall see later, other constraints will be induced by observed linguistic facts.

(i) The topic and the focus are complementary, i.e. do not overlap and jointly cover all of an SR.
(ii) The topic and the focus are continuous segments of an SR, i.e. $|^{F}$ occurs only once in an SR.
(iii) The topic precedes the focus, i.e. the end of the focus is also the end of an SR. Consequently it need not be denoted in an SR: it is implied by].
(iv) The topic and the focus are not empty. This implies that $|^{F}$ is never found at the beginning or the end of an SR.

Constraint (iv) has been added on the basis of Hajičová's examples, none of which contain empty topics and foci.

6.3 *The Verb Constituent in the Topic-Focus Division*

For sentences that fit template (36), i.e. where $n = 2$, constraint (iv) implies that the boundary $|^{F}$ that separates the topic and the focus is adjacent to the verb. Sentence (22) can only correspond to SR (40) or to SR (41), depending on the position of the boundary between its topic and its focus.

(40) [(the professors)$_{ag}$ $|^{F}$ sign.PST (a petition)$_{pat}$]

(41) [(the professors)$_{ag}$ sign.PST $|^{F}$ (a petition)$_{pat}$]

For each occurrence of sentence (22), the context and the setting of the utterance prompt a choice between SR (40) and SR (41). A sentence can be associated with a specific context and setting by means of a *sequence*, i.e. a fragment

of discourse in which the sentence occurs. SR (40) imposes itself in, for example, sequence (42), while SR (41) imposes itself in sequence (43).[15]

(42) "What did the professors do? *The professors signed a petition.*"

(43) "What did the professors sign? *The professors signed a petition.*"

In (40), the verb constituent sign.PST contains new information, whereas in (41) the fact that something was signed is considered known.

Hajičová generalizes constraint (iv) over sentences for which $n \geq 2$. Cf. sentence (38), which fits template (39).

Here it is technically possible to insert the topic-focus border $|^{F}$ either before (A_2) or between (A_2) and (A_3). Templates in which $|^{F}$ has been inserted will be referred to as *F-templates*. For sentence (38), the insertion of $|^{F}$ before (A_2) yields SR (44), fitting F-template (45), whereas inserting $|^{F}$ after (A_2) yields SR (46), fitting F-template (47).

(44) [(Mother)$_{ag}$ scold.PST $|^{F}$ (her daughter)$_{pat}$ (her bad marks)$_{caus}$]

(45) [(A_1) V $|^{F}$ (A_2) (A_3)]

(46) [(Mother)$_{ag}$ scold.PST (her daughter)$_{pat}$ $|^{F}$ (her bad marks)$_{caus}$]

(47) [(A_1) V (A_2) $|^{F}$ (A_3)]

Hajičová bans F-template (47):

> As for the position of the verb in the SR, we assume that the verb always stands between its contextually bound and contextually non-bound participants; the verb is thus either the most dynamic contextually bound element or the least dynamic contextually non-bound element. (H84)

This implies constraint (v).

(v) The focus starts either immediately before or immediately after the constituent that contains the finite verb, i.e. $|^{F}$ is adjacent to the verb.

15 Examples of sequences are supplied with double quotation marks.

Constraint (v) not only bans F-template (47) but also (48).

(48) $[(A_1) \mid^{F} (A_2)\ V\ (A_3)]$

Hajičová does not discuss the methodological status of constraint (v). It may be an empirical constraint, i.e. follow on from the observation that the F-boundary is always adjacent to the verb in a CD scale and consequently never separates adjacent constituents that depend on it. This amounts to the statement that sentences with F-template (47) do not occur because we have never seen them.

Constraint (v) may also be a preset constraint, a corollary of the definition of the segmentation of the CD scale into a contextually bound and a contextually non-bound stretch. Such a definition is not supplied but if it must entail constraint (v), it is likely to be complex, as it would presuppose that the verb is instrumental in determining the boundary of contextual boundness for the constituents it dominates while at the same time being subject to the definition, since the verb itself is the only constituent in the CD scale that may occur on either side of the F-boundary.

Finally, constraint (v) may be preset in the sense that it stands for the act of excluding sentences that fit F-template (47) from the class of sentences under investigation.

Constraint (v) does raise the question of how Hajičová handles instances to which F-template (47) appears to apply. What, for instance, are the CD and the likely topic-focus division for sentence (38) likely to look like when it occurs in sequence (49)?

(49) "Why did Mother scold her daughter? *Mother scolded her daughter because of her bad marks.*"

In this context, Mother's scolding her daughter seems to be contextually bound: only the reason for her doing so is presented as new information. So the F-boundary in the CD scale would be expected to set apart just the constituent (her bad marks)$_{caus}$. If nothing else changes, this produces SR (46), fitting F-template (47).

In her examples, however, Hajičová avoids F-template (47) for sentences of this type by rearranging the CD order of the constituents within the topic, e.g. by interchanging the constituents scold.PST and (her daughter)$_{pat}$, so as to land the verb at the end of the topic. This produces SR (50).

(50) $[(\text{Mother})_{ag}\ (\text{her daughter})_{pat}\ \text{scold.PST} \mid^{F} (\text{her bad marks})_{caus}]$

The practice of putting the verb in the last position of the topic may either be based on empirical observation or reflect the assumption that reality happens to be that way: it is reminiscent of surface word order in Russian and Czech, cf. sentence (21). Or it may be a convention, specifically intended to accommodate the arrangement of the items in the semantic representation to the constraint. This would imply that the order of the constituents on the CD scale is at least partly conventional instead of modelling what happens when people communicate. This remains to be clarified.

Applied to the class of sentences to be investigated as determined by template (35), constraints (i) through (v) eliminate all technically possible F-templates except two, viz. (51) and (52).

(51) $[(A_1) \ldots (A_i) \mid^{\mathrm{F}} V\ (A_{i+1}) \ldots (A_n)]$

(52) $[(A_1) \ldots (A_i)\ V \mid^{\mathrm{F}} (A_{i+1}) \ldots (A_n)]$

SRs (40) and (41) illustrate these F-templates for $n = 2$. SR (50) is an instance of F-template (52), where $n = 3$ and $i = 2$.

So, as far as the topic-focus division is concerned Hajičová takes only two types of sentence into consideration: those with the verb in the topic and those with the verb in the focus.

6.4 *Non-projective Semantic Representations*

As noted in 5.3.3, Hajičová's practice of reducing semantic representations to linear structures by mapping the dependency structures onto their matching CD scales by means of brackets may present a problem for topic-focus division in SRs that are not *projective*, i.e. in which the dependency branches are entangled. The problem will be discussed here.

Consider sentence (53).

(53) The associate professors signed the PETITION.

Here *associate* depends on *professors*. In the CD hierarchy of the likely SR of sentence (53), the two constituents are likely to be adjacent. This may produce SR (54).

(54) $[(\text{professors.}\textsc{def}\ (\text{associate})_{att})_{ag} \mid^{\mathrm{F}} \text{sign.}\textsc{pst}\ (\text{petition})_{pat}]$

So far, so good. But matters are not so simple when *associate* gets prosodic stress, as in sentence (55).

(55) The ASSOCIATE professors signed the petition.

Here the constituent with the highest CD is (associate)$_{att}$, which consequently ends up in the final position of the SR. But professors.DEF is likely to refer to known information: sentence (55) is an appropriate answer to the question which professors signed, or can be used to contradict the assumption that none of the professors signed. Hajičová realizes that there is a problem here.

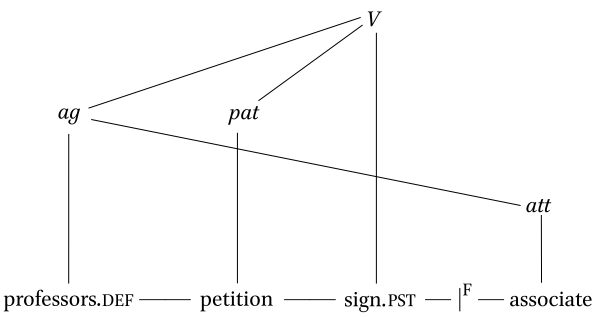
> We work here only with the verb and its participants as wholes without taking into account their internal structure, but we are aware that it should be investigated whether, for example, the boundary between the contextually bound and non-bound elements can be drawn only after or before a participant taken as a whole, or whether it would be possible to draw this line for instance inside such a participant standing at the extreme right-hand side of the SR. (H84)

The prospects of solving the problem in this manner are doubtful insofar as professors.DEF is not necessarily the second most dynamic contextually bound constituent; so professors.DEF and (associate)$_{att}$ are not likely to be adjacent on the CD scale.

In fact Hajičová even precludes their adjacency as she imposes constraint (v), which stipulates that the verb must be adjacent to the F-boundary (cf. 6.3).

This implies that the resulting SR is not projective: when matching the dependency structure on the CD scale, the branches get entangled, as shown in Figure (56).

(56)



Non-projective SRs cannot be rendered in the linear format that is used for SRs to analyse FSP and negation and in which the dependency structure is marked by brackets.

So Hajičová has virtually added yet another constraint, viz. (vi), which removes non-projective sentences from the class of sentences under investigation.

(vi) An F-boundary does not split constituents that depend directly on the verb.

Since non-projective SRs like (56) do occur, (vi) is a preset constraint. No easy solution seems to be available. The adopted SR-format presupposes that the topic vs. focus articulation operates on the main categories of the syntactic structure of a sentence. As it turns out, it is not a simple matter to plot communicative dynamism onto syntactic structure.

7 The Scope of Negation in the Semantic Representation

The next question to be dealt with is how negation must be incorporated into the SR of a sentence. Hajičová considers the following options (H84–85).

(a) treating the semantics of negation as a part of the lexical meaning of the verb (cf. French *ignorer* 'not know' or Russian *molčat'* 'not speak'), and:
(b) treating the semantics of negation as a grammatical category characterizing the verb (similar to tense and mood).

These approaches are prompted by Czech orthography, which treats the negation morpheme *ne-* as a part of the verb: *byl* 'was'; *nebyl* 'was not'.

Incorporating the semantics of negation into the verb constituent would either block the possibility to mark the difference between sentence negation and constituent negation in the SR, or treat sentence negation and constituent negation as disparate phenomena.

Regarding both consequences as undesirable, Hajičová decides that negation should be dissociated from the verb. She inserts what she calls the *operator of negation* into the SR as a "free participant", labelled *Neg* (H84–85).

7.1 *Scope of Negation* (*N*-)*Boundaries*

What Hajičová actually does is introducing *Neg* as another boundary in the linear SR, marking the beginning of the scope of negation in the CD scale of a negative sentence [H84]. She implicitly assumes that the scope of negation is a continuous substring in an SR, which comprises the "negated constituents". In the present discussion, *Neg* will be denoted as a boundary symbol $|^{N}$.

Hajičová uses a slash / as the symbol marking the end of the scope of negation (H86). It will be replaced by $^{N}|$ here, if only because Hajičová sometimes uses slashes to mark a focus boundary (e.g. in H90).

In Hajičová's examples, the operator of negation never occurs at the beginning of an SR. Usually, the agent belongs in the complement. Consider, as an example, SR (57), which is a likely SR for sentence (18).

(57) [(the professors)$_{ag}$ $|^{N}$ sign.PST (a petition)$_{pat}$ $^{N}|$]

Apparently, the agent in the SR is only admitted into the scope of negation if at least one other argument of the verb is part of the complement, as in SR (58) of sentence (19).

(58) [(a petition)$_{pat}$ $|^{N}$ sign.PST (the professors)$_{ag}$ $^{N}|$]

This implies that instances of *external negation*, i.e. negative sentences without a complement, are excluded from the class of sentences to be investigated. Negative sentences in which there is no apparent agent or in which the absence of the agent in the situation is explicitly marked and in which no other argument is available for the complement, such as (59) and (60), are left out of consideration.[16]

(59) It is not RAINING.

(60) No RAIN is falling.

7.2 *Preset Constraints on the Positions of N-Boundaries*

Here is a list of Hajičová's preset constraints on the positions of the N-boundaries. These, too, follow either from the descriptive framework or from the exclusion of counter-examples from the class of sentences under investigation (as in the case of external negation).

(vii) The scope of negation does not coincide with the SR: there is always a constituent that falls outside it.

(viii) The scope of negation is not empty: there is always a constituent that belongs to it.

16 Hajičová discusses external negation in Hajičová 1984, 104.

(ix) The scope of negation is continuous, i.e. $|^{N}$ and $^{N}|$ occur only once in an SR and in the given order.

The constraints on the positions of F- and N-boundaries diverge. Whereas the end of the focus is fixed at the end of the sentence, there are few limitations on the position of the terminal N-boundary so far. Thus, the constraints allow for the possibility that there are non-empty stretches on the CD scale both preceding and following the scope of negation. The existence of such *split complements* is admitted and instances actually occur, as we shall see in 11.1.1ff. A proper term to refer to the second stretch is lacking so far, even though its position in the CD implies that it conveys the newest information and suggests that it is the most important part of the sentence.

The relative freedom of $^{N}|$ allows for a number of *N-templates*. Even the simplest class of SRs, viz. where $n = 2$ (cf. (36)), allows for 5 *N-templates*, viz. (61) through (65).

(61) $[|^{N} (A_1) \, ^{N}| \, V \, (A_2)]$

(62) $[(A_1) \, |^{N} \, V \, ^{N}| \, (A_2)]$

(63) $[(A_1) \, V \, |^{N} \, (A_2) \, ^{N}|]$

(64) $[|^{N} (A_1) \, V \, ^{N}| \, (A_2)]$

(65) $[(A_1) \, |^{N} \, V \, (A_2) \, ^{N}|]$

8 Combining F- and N-Boundaries in a Semantic Representation

The two types of boundary that have been identified can be combined in a single SR. Taking account of the constraints that have been identified so far, the number of available patterns is determined by formula (66). Here $N^{FN}(35)$ is the number of possible *FN-templates* that are compatible with template (35), while n represents the number of constituents directly depending on the finite verb.

(66) $N^{FN}(35) = (((n + 1)^2 + n + 1)/2 - 1)2$

In the simplest type of SR represented by template (36), i.e. in which $n = 2$, the two legitimate ways of assigning the F-boundary and the five legitimate ways

of assigning N-boundaries yield ten different available FN-templates. They are listed here for future reference.

(67) $[|^{N} (A_1) {}^{N}| |^{F} V (A_2)]$ (suppressed in 10.1)

(68) $[|^{N} (A_1) |^{F} V {}^{N}| (A_2)]$ (suppressed in 10.1)

(69) $[(A_1) |^{F} |^{N} V {}^{N}| (A_2)]$

(70) $[(A_1) |^{F} |^{N} V (A_2) {}^{N}|]$

(71) $[(A_1) |^{F} V |^{N} (A_2) {}^{N}|]$ (suppressed in 11.3.1)

(72) $[|^{N} (A_1) {}^{N}| V |^{F} (A_2)]$ (suppressed in 10.1)

(73) $[|^{N} (A_1) V {}^{N}| |^{F} (A_2)]$ (suppressed in 10.1)

(74) $[(A_1) |^{N} V {}^{N}| |^{F} (A_2)]$

(75) $[(A_1) |^{N} V |^{F} (A_2) {}^{N}|]$ (suppressed in 11.2.1)

(76) $[(A_1) V |^{F} |^{N} (A_2) {}^{N}|]$

If $n = 3$, i.e. if a third constituent is added to template (36), the number of possible FN-templates is 18, as predicted by formula (66). For $n = 4$, there are 28 possible FN-templates, etc.

Hajičová's next goal is detecting further constraints that limit the freedom of the scope of negation, i.e. reduce the number of FN-templates to be investigated.

9 Inferential Frames (*IF*)

As we saw in the discussion of sentences (5) and (6), Hajičová tells the difference between two sentences by the inferences that hearers (are expected to) make when confronted with them. When hearing sentence (6), the hearer infers that the arrival occurred (or that the speaker wants to make him believe that it did, etc.). In the case of sentence (5), the thought of an arrival is triggered in the hearer's mind, but the sentence does not provide him with sufficient clues as to whether it actually occurred. But the hearer may arrive at

that inference by inspecting the context and the setting in which the sentence is uttered.

When a sentence is amenable to two or more different inferences, this is an indication that it may correspond to different SRs, i.e. in which the F- and N-boundaries have different positions. The inferences that are triggered by sentences when they are used in utterances can be used to predict the positions of those boundaries.

In Hajičová's account, *inference* is not a concept. Hajičová circumscribes what happens when inferences are made, e.g. in her comment on sentence (5) cited in 2.3 ("corresponds to a situation when they "need not have come"") and sometimes uses Jackendoff's term *interpretation*. In a pragmatic mode of describing language events, the term *inference* may be more appropriate, as it refers to what hearers do when narrative or descriptive sentences are uttered.

It may be convenient to abstract from *individual* inferences triggered by individual utterances of individual sentences and to introduce a concept to refer to the *patterns* of inferences that occur. The notion of *inferential frame* (*IF*) is introduced here as a non-formal auxiliary concept to classify the options available to the hearer of an uttered sentence depending on the setting and context. The concept is intended to facilitate the discussion about the way in which inferences are used as a basis for comparison of sentences and SRs.

Consider sentences (77) and (78).[17]

(77) Because his wife was ill, John didn't COME.

(78) John didn't come because his wife was ILL.

No specific formal SRs will be discussed as yet; but valid SRs of (77) and (78) are likely to contain three constituents: a verb constituent (referring to an ***S***), a noun constituent (for the agent of ***S***) and a causal subordinate clause (referring to an ***s***).

According to Hajičová, there is an essential difference between sentences (77) and (78). When uttered under a normal prosodic pattern, sentence (77) can only prompt the inference that John's wife was ill. Sentence (78), given a propitious context or setting, allows for the inference that she was not.

Both (77) and (78) are bisituational. They refer to two situations: situation ***s*** of John's wife's being sick is a building brick of situation ***S*** of John's arrival. The

17 Sentences (77) and (78) are (3)(b) and (3)(a) on H85. Hajičová has *since* instead of *because*.

sentences contain a negation, i.e. an appeal to the hearer to think of a third situation ***S***′ that is characterized by the absence of a situation that is characterized by constituents of (77) and (78). The question is which elements in the semantic construct underlying a sentence are stratified by that negation, i.e. viewed as characteristics of the third situation ***S***′. The three possible inferences that Hajičová distinguishes for these sentences (H85) can be viewed as instances of three different inferential frames.

For sentence (77), only one inferential frame is available, viz. IF **A**.

A – Situation ***S*** does not exist.
– Situation ***s*** exists.
– The *cause* of the non-existence of situation ***S*** is the existence of situation ***s***.

Inference (79) of sentence (77) is an instance of IF **A** (H85).[18]

(79) 'John did not come, the reason for his not coming being his wife's illness.'

For sentence (78), on the other hand, three different IFs are available: **A**, **B** and **C**.

Inference (79), which is an instance of IF **A**, imposes itself in sequence (80) containing sentence (78) (H85).[19]

(80) "*John didn't come because his wife was ill.* He had to go for a doctor to examine her thoroughly."

Sentence (78) also allows for instances of IF **B** (H85).

B – Situation ***S*** exists.
– The *cause* of the existence of situation ***S*** is not the existence of situation ***s***.

IF **B** implies inference (81) of sentence (78): it imposes itself in sequence (82) containing sentence (78) (H85).

(81) 'John came, the reason not being that his wife was ill.'

18 Examples of specific inferences are supplied with single quotation marks.
19 Sequence (80) is (3)(a)(i) on H85.

(82) "*John didn't come because his wife was ill* but because he wanted to meet Harry at the hospital."

Note that IF **B** does not include reference to the very existence of situation ***s***. It only allows for the conclusion that ***s*** did not cause ***S***.

Finally, Hajičová observes that sentence (78), given an appropriate context or setting, also allows for IF **C**.

C – Situation ***S*** does not exist.
– The *cause* of the non-existence of situation ***S*** is not situation ***s***.

IF **C** includes inference (83) for sentence (78): it imposes itself in sequence (84) containing sentence (78) (H85).

(83) 'John did not come, the reason for his not coming not being his wife's illness.'

(84) "*John didn't come because his wife was ill* but because he was too busy yesterday; his wife is out in the mountains with the children."

Inferential frames are a soft concept: no hard criteria are available for assembling and using them in a principled way (see also sections 15 and 17). But they are a useful device for handling Hajičová's "interpretations" somewhat more transparently.

According to Hajičová, the inferences fitting IFs **A**, **B** and **C** that are found for sentence (78) can also be found for sentence (85), which is identical to (78) except that the prosodic stress has moved to the constituent marking the causal adjunct (H85).[20]

(85) Because his wife was ILL, John didn't come.

This makes sense since the stressed constituent in the surface structure of the sentence tends to mark the terminal item in a CD scale. As announced in 5.4, no special attention will be paid to sentences with "non-neutral" prosodic contours, as their SRs are assumed to coincide with those of sentences with neutral contours: the CD of (85) is assumed to coincide with the CD of (78).

More IFs will be introduced when Hajičová starts using them (e.g. in 11.1.2).

20 Sentence (85) is (3)(c) on H85.

9.1 *Negation Haplology*

Native speakers of English to whom the present writer submitted sentence (78) in sequence (84) rejected its appropriateness for IF **C**. They said that sequence (84) should be avoided: a speaker who really intends to impose an IF **C** inference with the given lexical material should insert an additional not_2, which yields sequence (86).

(86) "*John didn't not come because his wife was ill* but because he was too busy yesterday; his wife is out in the mountains with the children."

Examples of not_2 cancelling a negation are found in sequence (87), which comes from a 1993 interview with Susan Sontag (Hadžiselimović and Radeljković 2007). Sontag explains why she had not visited the besieged city of Sarajevo before.

(87) "*I didn't not come* before because I was afraid, *I didn't not come* because I wasn't interested. *I didn't not* [*sic*] *come* before because I didn't know what's the use of it. [...] I couldn't justify it to myself unless I thought there was some use to it, use to you, the people of Sarajevo, the people of Bosnia and Herzegovina."

The occurrences of not_2 in the first clause and the second clause are intended to ensure IF **C** inferences. The second *not* in the third clause of (87) is unintended and illustrates the downside of the "correct" practice: too many *not*s tend to confuse speakers, hearers and editors alike.

The fuzziness of IF **C** is not restricted to English. Sentence (88), a counterpart of (84) in Dutch, also triggered a lively debate on its acceptability.

(88) Jan kwam niet omdat zijn vrouw ziek was maar
Jan came not because his wife ill was but
omdat hij de trein gemist had.
because he the train missed had
'Jan didn't come because his wife was ill but because he had missed his train.'

In so far as speakers use and accept IF **C** for sentences (84) and (88), we are dealing with instances of *negation haplology*: if the rules of a grammar risk producing an accumulation of formally identical elements at a given position, a transduction rule takes care of producing the element just once. If a grammar assigns the markers of different scopes of negation within a single sentence to

the same position in its surface structure, such a filter rule may allow only one occurrence there.

Such a haplology rule is operative on Afrikaans end-of-scope marking with *nie*$_2$ (cf. (16) and (17)). Consider sentence (89) (from Waher 1978, 71).

(89) Ek was nie daarvan bewus dat sy hul nie
I was not PROCLAUSE-of aware that they them not
daarvan in kennis gestel het dat die voorsitter nie
PROCLAUSE-of informed have that the chairman not
betyds kan opdaag nie.
in_time can turn_up *nie*$_2$
'I did not know that they had not informed them that the chair cannot arrive in time.'

Without a haplology rule, three occurrences of *nie*$_2$ should turn up at the end of (89): one to terminate the scope of negated *bewus* 'aware', one for the scope of negated *in kennis gestel* 'informed', and one for the scope of negated *kan* 'can', each of these scopes having been opened up by an occurrence of *nie*$_1$ 'not'. Instead, only one occurrence of *nie*$_2$ has made its way to the surface.

This provides another argument in support of handling negation in the deep structure rather than in a separate logical semantic representation (cf. 3.3). Inserting the filter rule between the logical representation and the surface structure would produce syntactic rules that do not belong to the syntactic component. Some authors propose to account for the filter in terms of speakers' memory management instead of syntactic rules (e.g. Heynick 1985). But the filter may be regarded as redundant if the apparent haplology is explained in semantic terms. Afrikaans *nie*$_2$ may be defined, not as the surface equivalent of a logical closing bracket, but as an instruction to the hearer to close *all* scopes of negation that the speaker happens to have opened up.

The Afrikaans case is different from the English and the Dutch ones (sentences (84) and (88)) in that the filter affects the markers of the end of the scope of negation, not those marking the beginning. But a similar solution may turn out to be convenient. We shall return to this point in section 16.

In what follows below, we can afford to leave the issue of the acceptability of IF **C** for (84) and (88) out of consideration as Hajičová's does not return to instances of IF **C** in her further argument. We shall return to it, however, in section 14 when discussing ideas on a typology of negation.

10 Limitations on the Initial N-Boundary

Hajičová proceeds to explore the possibility of further constraints on the positions of the N-boundaries. She starts out investigating whether there are limits on the position of the initial N-boundary, given the position of the F-boundary.

10.1 *The Initial N-Boundary in the Topic*

Step one is investigating the possible positions of an initial N-boundary in the topic of an SR.

Consider the constituent (his wife was ill)$_{caus}$ as it occurs in the SRs of sentences (77), (78) and (85). Hajičová observes that (his wife was ill)$_{caus}$ may or may not occur in the focus of SRs of such ambiguous sentences as (78) and (85), depending on the appropriate IFs in the specific settings or contexts in which the sentences are uttered (H85). But (his wife was ill)$_{caus}$ can only belong in the topic of such straightforward sentences as (77). Consequently, (90) is the only available SR for sentence (77), which is exclusively compatible with IF **A**.

(90) [(his wife was ill)$_{caus}$ (John)$_{ag}$ |^{F} |^{N} come.PST ^{N}|]

This prompts Hajičová's assumption that constituents depending on the verb constituent that belong to the topic also belong to the complement of the SR:

> These observations suggest that that part of the sentence which in the hierarchy of CD stands to the left of the verb is out of the scope of negation; [...]. (H85).

The verb constituent itself, Hajičová continues, may be either inside or outside the scope of negation (H85). It is inside the scope of negation under inferences (79) and (83), which fit IF **A** and IF **C**, respectively. It is outside the scope of negation under inference (81), which fits IF **B**.

This boils down to constraint (x).

(x) If the scope of negation starts in the topic, it starts with the verb; i.e. the leftmost position where boundary |^{N} can occur in an SR is immediately before the verb.

Constraint (x) can be qualified as *empirical* as it is motivated by Hajičová's observations, rather than being an implication of the format of description or the result of the selection of sentence types under investigation.

By adopting constraint (x), Hajičová claims that the only constituent in the topic that can be negated at all is the verb. SR (93) of sentence (91) in sequence (92) is an example.

(91) Because his wife was ill, John didn't bring THE CHILDREN.

(92) "Who was it John didn't bring because his wife was ill? *Because his wife was ill, John didn't bring the children.*"

(93) [(his wife was ill)$_{caus}$ (John)$_{ag}$ |^{N} bring.PST |^{F} (the children)$_{pat}$ ^{N}|]

Constraint (x) considerably reduces the number of available positions for boundary |^{N}. For $n = 2$, FN-templates (67), (68), (72) and (73) are hence disallowed. For $n \geq 3$, this rules out, e.g., FN-template (94), as exemplified by (95).

(94) [(A_1) |^{N} (A_2) V |^{F} (A_3) ^{N}|]

(95) [(his wife was ill)$_{caus}$ |^{N} (John)$_{ag}$ bring.PST |^{F} (the children)$_{pat}$ ^{N}|]

The empirical basis of constraint (x) may require further examination. Constraint (v) stipulates that the verb be in the rightmost position of the topic. Constraint (x) implies the condition that the constituents to the left of the verb be in both the topic and the complement of the scope of negation. This means that any constituents in the topic that depend on the verb must be lower in the CD hierarchy than the verb itself.

This works out well in SR (93), where the constituents to the left of the verb in the topic are the causal adjunct and the agent. In other instances, however, the combined constraints may aggravate the issue involving constraint (v) that was raised in 6.3: when assigning a CD to a sentence, Prague functionalists seem to operate a convention that overrides functional considerations. Consider sentence (96), as in sequence (97), yielding IF **A**.

(96) He did not catch a cold because of the WEATHER.

(97) "Why didn't John catch a cold? *He did not catch a cold because of the weather.*"

Hajičová's constraints rule out SR (98).

(98) [|^{N} (he)$_{ag}$ catch.PST (a cold)$_{pat}$ ^{N}| |^{F} (weather)$_{caus}$]

This might be granted in view of the ban on empty complements (i.e. constraint (vii)), or rather the convention to assign the agent to the complement and the exclusion of instances of external negation (cf. 7.1). But constraints (v) and (x) also rule out SR (99), in which the object (a cold)$_{pat}$ follows the verb in the CD without ending up in the focus.

(99) [(he)$_{ag}$ |^{N} catch.PST (a cold)$_{pat}$ ^{N}| |^{F} (weather)$_{caus}$]

The only way to avoid this is to assume that not only (he)$_{ag}$ but also (a cold)$_{pat}$ appears to the left of the verb in the CD hierarchy and in the complement, as in (100).

(100) [(he)$_{ag}$ (a cold)$_{pat}$ |^{N} catch.PST ^{N}| |^{F} (weather)$_{caus}$]

But it does not seem to make sense to place (a cold)$_{pat}$ outside the scope of negation. It is the complete situation of John's catching a cold that is negated. This could be avoided by treating *catch a cold* as an idiom, i.e. as a single constituent that counts as a verb. But then again, this is hardly feasible for, say, *sight a bear* in sentence (101) and sequence (102).

(101) He did not sight a bear because of the WEATHER.

(102) "Why didn't John sight a bear? *He did not sight a bear because of the weather.*"

So it looks as if Hajičová's constraint (x) is a preset constraint, a convention rather than an empirical one.

At the same time, the fact that John's wife's illness is effectively removed from the scope of negation by positing it before the verb in the SRs of sentences like (77) must be acknowledged in some way. As a conceivable way out, it might be considered to assume that there are different types of constituent depending on the verb, and apply the constraint only to those constituents that speakers use to conjure up a second situation, i.e. an *s*, like A_{caus}.

10.2 *The Initial N-Boundary in the Focus*

As a next step Hajičová figures out whether it is possible to impose constraints on the *rightmost* position of |^{N}. How far to the right on the CD scale is the scope of negation allowed to start? Hajičová considers sentence (103), which

features three arguments for the verb. The verb comes between (A_1) and (A_2), fitting template (39), or between (A_2) and (A_3), fitting template (104).[21]

(103) Mother didn't scold her daughter because of the FATHER.

(104) $[(A_1)\ (A_2)\ V\ (A_3)]$

Since constraint (x) implies that the leftmost position of $|^N$ is immediately before the verb, only the SRs in which the verb itself is outside the scope of negation, i.e. in which $|^N$ occurs to the right of the verb, are relevant to the present issue. These are the SRs with constituent negation, as in the case of sentence (78) with inference (81). We have instances of IF **B** here. Applying IF **B** to sentence (103), it is inferred that an instance ***S*** of Mother's scolding has occurred, while the negation is used to conjure up the thought of other situations ***s*** causing it than the ones that involve the father.

Hajičová lists six acceptable SRs for sentence (103), each with a different topic-focus or scope of negation division, depending on the context or the setting (H86). Four of them are not relevant to the present argument as they include the verb in the scope of negation. The other two are instances of constituent negation and will be discussed here.

Consider sentence (103) in sequence (105).

(105) "*Mother didn't scold her daughter because of the father* but because of her bad marks at school."

The cause of (or reason for) the scolding is denied, which appears to produce an instance of IF **B**: situation ***S*** of Mother's scolding her daughter exists. Situation ***s***, which is the situation that characterizes ***S*** and is in turn characterized by the participation (actions, presence, thought, etc.) of the father, is denied. Or rather, its role in the scolding is denied: the question of the existence of situation ***s*** itself is up in the air.

This implies that the constituent $(\text{her father})_{caus}$ belongs to both the focus and the scope of negation: the constituents $(\text{Mother})_{ag}$ and $(\text{her daughter})_{pat}$ are part of the topic and occur in the SR before the verb. This produces SR (106).[22]

21 Sentence (103) is (6) on H85.

22 SR (106) is (6)(iv)(b) on H86.

(106) [(Mother)$_{ag}$ (her daughter)$_{pat}$ scold.PST |^{F} |^{N} (the father)$_{caus}$ ^{N}|]

Sequence (107) containing sentence (103) is different from (105) in that both the object of the scolding and the reason for it are denied (H85).[23]

(107) "*Mother didn't scold her daughter because of the father* but her son because of his bad marks at school."

Sequence (107) prompts SR (108) for (103), in which both the object constituent (her daughter)$_{pat}$ and the causal adjunct (her father)$_{caus}$ are moved to the focus and the scope of negation.[24]

(108) [(Mother)$_{ag}$ scold.PST |^{F} |^{N} (her daughter)$_{pat}$ (the father)$_{caus}$ ^{N}|]

Hajičová adduces these SRs of sentence (103), and the SRs of a few more sentences fitting the same templates, to argue that, in the case of constituent negation, the scope of negation starts immediately after the verb (H86). This is constraint (xi).

(xi) The rightmost position where boundary |^{N} can occur in an SR is immediately after the verb.

This rules out inserting |^{N} between dependent constituents following the verb, i.e. instances that fit FN-template (109), where $i \neq j$ and $j \neq n$.

(109) [(A_1) … (A_i) |^{F} V (A_{i+1}) … (A_j) |^{N} (A_{j+1}) … (A_n) ^{N}|]

Constraint (xi) qualifies as a genuine empirical constraint, in as far as the present writer has not found an appropriate context or setting that would make SR (110) acceptable for sentence (103), i.e. in which the communicative dynamism of (her daughter)$_{pat}$ would exceed that of the verb constituent without being negated.

(110) [(Mother)$_{ag}$ scold.PST |^{F} (her daughter)$_{pat}$ |^{N} (the father)$_{caus}$ ^{N}|]

23 Sequence (107) is (6)(a) on H85.
24 SR (108) is (6)(ii)(b) on H86.

Expressing the message contained in SR (110) would require a more specific phrasing, something like "mother scolded her daughter *but not* because of the father".

Yet constraint (xi) appears to exclude another class of sentences that should eventually be included in the analysis.

It is correct that, if |N follows the verb, we are dealing with constituent negation. Constraint (xi) applies to those cases: the scope of negation only allows constituents that follow the verb in the CD. But the converse does not hold, in spite of Hajičová's statement to that effect at the top of H85. Consider sentence (111) as occurring in sequence (112). SR (113) seems to be the only way to handle it.

(111) Mother didn't SCOLD her daughter because of the father.

(112) "*Mother didn't scold her daughter because of the father* but praise her because of him."

(113) [(Mother)$_{ag}$ (her daughter)$_{pat}$ (the father)$_{caus}$ |F |N scold.PST N|]

This variety of constituent negation, in which the verb itself is the negated constituent, is not discussed in Hajičová's paper.

Other anomalies that are excluded from the investigated types of SR include cases in which the verb is the only constituent in the topic and the complement, as in SR (114) for (103) in sequence (115), which is, admittedly, far-fetched.

(114) [scold.PST |F |N (Mother)$_{ag}$ (her daughter)$_{pat}$ (the father)$_{caus}$ N|]

(115) "You've got it all wrong. *Mother didn't scold her daughter because of the father* but Grandmother scolded her grandson because of his bad marks at school."

So the position of SRs in which the verb is the only constituent in either the topic or the focus must be dealt with in a separate exercise. This is another price to be paid for imposing that many limitations on the position of the verb in SRs of negative sentences.

11 Limitations on the Terminal N-Boundary

On the condition of accepting Hajičová's constraints on the position of the N-boundary $|^{N}$ that have been discussed so far, Hajičová's following conclusion can be subscribed to.

> To sum up, *Neg* [i.e. $|^{N}$] can stand in [the] SR of the sentence either immediately before the verb or also, in the case where the verb is a contextually bound element, immediately after the verb. (H86)

Since the same constraints apply to the position of the F-boundary $|^{F}$ (cf. 6.3), the class of sentences under investigation as determined by template (35) allows for four technically admissible templates in which the initial F- and N-boundaries $|^{F}$ and $|^{N}$ are fixed. They are listed as (116) through (119) below. Since the position of the terminal boundary $^{N}|$ has not yet been settled, they will be referred to as *incomplete* FN-templates. The relative order of the adjacent F- and N-borders in (117) and (119) is not relevant.

(116) $[(A_1) \ldots (A_i) |^{N} V |^{F} (A_{i+1}) \ldots (A_n)]$

(117) $[(A_1) \ldots (A_i) V |^{F} |^{N} (A_{i+1}) \ldots (A_n)]$

(118) $[(A_1) \ldots (A_i) |^{F} V |^{N} (A_{i+1}) \ldots (A_n)]$

(119) $[(A_1) \ldots (A_i) |^{F} |^{N} V (A_{i+1}) \ldots (A_n)]$

Hajičová's next task is to check, for each of these incomplete FN-templates, to which extent the position of the terminal N-boundary $^{N}|$ of the scope of negation can be predicted knowing the positions of the other boundaries.

11.1 *Preliminary Issues*

Before checking the possible positions of the terminal N-boundary $^{N}|$ given the positions of $|^{F}$ and $|^{N}$, Hajičová discusses some examples that are intended to answer two preliminary questions, viz.:

(a) Given the positions of $|^{F}$ and $|^{N}$ in an SR, can the position of $^{N}|$ vary at all?
(b) Is any variation of the position of $^{N}|$ given the positions of $|^{F}$ and $|^{N}$ in an SR, "semantically relevant"? (H87)

11.1.1 The Autonomy of the Terminal N-Boundary

As to the question of the mobility of the terminal N-boundary $^{N}|$, Hajičová observes the following.

> An assumption presents itself to define the semantic scope of negation as that part of [an] SR that stands to the right of *Neg*. However, the examples [(78) and (77)] show that the situation is more complicated. (H86)[25]

In sentence (77), it is obvious that the constituent (his wife was ill)$_{caus}$ is outside the scope of negation, as it is exclusively compatible with IF **A** and belongs in the topic: cf. SR (90). In sentence (78) on the other hand, (his wife was ill)$_{caus}$ belongs in the focus, at least under IF **A**.[26] It makes no difference whether the verb is in the focus or in the topic: consider SRs (120) and (122), which fit FN-templates (69) and (74) respectively. They are both supported by sequence (80) but can be separated by sequences (121) and (123), respectively.

(120) [(John)$_{ag}$ $|^{F}$ $|^{N}$ come.PST $^{N}|$ (his wife was ill)$_{caus}$]

(121) "What about John? *John didn't come because his wife was ill.*"

(122) [(John)$_{ag}$ $|^{N}$ come.PST $^{N}|$ $|^{F}$ (his wife was ill)$_{caus}$]

(123) "Why didn't John turn up? *John didn't come because his wife was ill.*"

So the end of the scope of negation does not necessarily coincide with the end of the sentence: split complements (cf. 7.2) actually occur.

11.1.2 The Semantic Relevance of the Terminal N-Boundary

The next question is whether the position of the terminal N-boundary $^{N}|$ is, in Hajičová's words, "semantically relevant" (H87). More specifically: assuming that two SRs for a single negative sentence are identical (have the same CD, the same topic-focus division and the same initial N-boundary) except for the position of the terminal N-boundary, will the difference be semantically relevant?

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25 Examples (78) and (77) are (3)(b) and (3)(a) on H85. Note that Hajičová's interpretation (i) of sentence (3)(a) on H86 is identical to her interpretation (iii) of (3)(a) on H85, whereas her interpretation (ii) of (3)(a) on H86 is identical to her interpretation (i) of (3)(a) on H85.

26 Hajičová adduces IF **B** for sentence (78) here (as (i) in her 4.0 on H86) but IF **B** does not play any role in her argument.

At first sight, this question is trivial: it may be expected that any differences between semantic representations are semantically relevant by definition.

But Hajičová wields two different conceptions of semantics. On the one hand, she uses Sgall's Praguian semantic representations: in that conception, the meaning of a sentence is fully accounted for in its SR: the rest is inference. On the other hand, she implicitly employs a conception of semantics according to which it is the inferences that hearers are expected to make when the sentence is uttered that make up the meaning of a sentence.

When referring to semantic relevance, Hajičová applies the second conception. If pairs of SRs that differ only by the position of $^{N}|$ in the focus correspond to different sets of inferences, she regards the difference as semantically relevant. So as to investigate whether such *minimal pairs* exist, Hajičová discusses a few examples.

The first is sentence (124).[27]

(124) She didn't come in time from the cinema because of her AUNT.

The various possible SRs for (124) that Hajičová discusses include (125) and (127).[28] They are supposed to occur in sequences (126) and (128).

(125) [(she)$_{ag}$ $|^{F}$ $|^{N}$ come.PST (in time)$_{temp}$ (from the cinema)$_{loc}$ $^{N}|$ (her aunt)$_{caus}$]

(126) "Why is her father angry with her? *She didn't come in time from the cinema because of her aunt*."

(127) [(she)$_{ag}$ $|^{F}$ $|^{N}$ come.PST (in time)$_{temp}$ (from the cinema)$_{loc}$ (her aunt)$_{caus}$ $^{N}|$]

(128) "What is the matter with Joan today? *She didn't come in time from the cinema* [...] *because of her aunt*, and that's something."

Sequence (126) triggers the usual IF **A** inference: "the reason of the event (*because of her aunt*) is mentioned in addition to the main (negative) statement" (H87). The structure of SR (125) is basically identical to SR (120).

In sequence (128), however, sentence (124) is intended to trigger the inference that:

27 (124) is (9) on H87.

28 (125) is (10′) on H87. (126) is (10) on H87. (127) is (11′) on H87. (128) is (11) on H87.

> [...] it is common that Joan comes from the cinema in time, at least because of her aunt; this time, however, she hasn't done so. (H87)

This presupposes an IF that has not been discussed so far and might run as follows.

D – Situation ***S*** exists$_1$.
– The *cause* of the existence$_1$ of situation ***S*** is the existence$_1$ of situation ***s***.
– Situation ***s*** exists$_2$.
– Situation ***S*** does not exist$_2$.

The hearer is expected to infer about a situation that it both exists and does not exist simultaneously. He can do so by assuming different modes of existence in terms of time: *existence$_1$* as characterizing a series of recurrent events in a period that includes the moment referred to, and *existence$_2$* as characterizing the very moment that is referred to. A situation may simultaneously exist in one sense and fail to exist in another. It might be considered to remove such contradictions by supplying SRs with Reichenbachian tense distinctions (e.g. Reichenbach 1947, 287ff.) that provide more detail than those prompted by just the verb morphology. But this would not always work: we shall return to this point below when discussing sentence (130).

SR (125) and SR (127) appear to make up a minimal pair as intended by Hajičová. While SR (125) fits IF **A** and SR (127) fits IF **D**, the two SRs are identical except for the position of terminal N-boundary $^{N}|$. While SR (125) reflects the negation of situation ***S*** of the main clause on the one hand and the cause ***s*** of the negation on the other, SR (127) simply reflects the complete negation of situation ***S***, cause and all.

The example may have to be amended. If (her aunt)$_{caus}$ is the cause of a recurrent event, it is not likely to belong in the final position of the CD hierarchy of a sentence that is uttered with a view to communicate an exception to the habit that it is presented as being the cause of. The constituent (her aunt)$_{caus}$ may be more contextually bound than some or all of the constituents come.PST, (in time)$_{temp}$ and (from the cinema)$_{loc}$.

So the sequence triggering IF **D** must warrant that the reason for sticking to the habit prompts itself as being more remarkable, "newer information", than the fact that an exception to the habit occurred. Hajičová tries to produce this effect by inserting "not even" between brackets between *cinema* and *because* in sequence (128). But a sequence in which the cause of the habit prompts itself in the last position of the CD without adapting sentence (124) would be more convincing. Perhaps sequence (129) is a valid example.

(129) "What is the matter with Joan? My rich in-laws often come over for dinner on Saturday night. This was always a reason for Joan to come in early from wherever she went in the afternoon. But this time, *she didn't come in time from the cinema because of her aunt*." I hope nothing serious happened."

Before discussing IF **D**, another example given by Hajičová will be discussed. Consider sentence (130).[29]

(130) He doesn't sleep because he is TIRED.

Sentence (130) allows for inference (131) as triggered in sequence (132), fitting IF **A**. In those circumstances, sentence (130) corresponds to SR (133), which fits FN-template (69).[30] This pattern was found for sentence (78) and (122) as well.

(131) 'He did not sleep, the reason for his not sleeping is his being tired.'

(132) "I don't know how long Paul can endure such a busy life. He is in his office the whole day, he works over midnight at home, and then *he doesn't sleep because he is tired.*"

(133) $[(\text{he})_{ag} \,|^{\text{F}}\, |^{\text{N}}\, \text{sleep.PRS}\, ^{\text{N}}|\, (\text{he is tired})_{caus}]$

According to Hajičová, sentence (130) is triggered by sequence (134).[31]

(134) "What is the matter with him tonight? (Usually) *he doesn't sleep because he is tired*, only today he couldn't endure such a tension and he got asleep."

She states that for the inference prompted by (134), "similar considerations are valid as in [inference (128)]" (H88) and inserts F- and N-boundaries in the same positions as in SR (135) for sentence (124) under IF **D** in SR (127).[32]

(135) $[(\text{he})_{ag} \,|^{\text{F}}\, |^{\text{N}}\, \text{sleep.PRS}\, (\text{he is tired})_{caus}\, ^{\text{N}}|]$

29 Sentence (130) is (12) on H87.
30 Sequence (132) is (13) on H87. SR (133) is (13′) on H88.
31 Sequence (134) is (14) on H88.
32 SR (135) is (14′) on H88.

At first sight, IF **D** does not apply to (135). The inference that prompts itself in sequence (134) is (136).

(136) 'His being tired does not cause his sleeping. But this time his being tired causes his sleeping.'

Here the causal connexion is negated for the recurrent situation and confirmed for the specific situation, which is the converse of the situation captured by IF **D**: in (129), ***s*** recurrently causes ***S*** but fails to do so in one particular instance; in (134), ***s*** recurrently fails to cause ***S*** but does cause it in one particular instance. This would produce a separate IF for (136), even though SR (127) as triggered by sequence (129) and SR (135) have F- and N-boundaries in the same positions.

On closer inspection, however, sequence (134) is more complex.

When discussing sentence (124) in sequence (128) and (129), it has been assumed that the way to reconcile the coexistence of two incompatible situations is to distinguish between situations in terms of temporality, i.e. by distinguishing situations characterizing a period of time on the one hand and situations characterizing a moment in time on the other. While logically satisfactory, it does not necessarily cover the pragmatics of sequence (134). As an alternative for assuming coexistence of incompatible situations in terms of time, it is assumed that such incompatibility can be resolved by assuming modal dimensions, such as *expected* existence and *observed* coexistence.

Both sequence (129) and sequence (134) imply that the hearer is expected to conjure up two situations simultaneously: a non-stratified situation ***S*** and situation $\boldsymbol{S^{non}}$ in which ***S*** is stratified for negation, i.e. which is solely characterized as its being different from ***S***. But the hearer is also expected to conjure up another situation $\hat{\boldsymbol{S}}$, which is characterized by the coexistence of both ***S*** and $\boldsymbol{S^{non}}$. If we may assume that IF **D** resolves not just temporal but also modal incompatibilities, it applies also when it is expected that ***s*** causes ***S*** but observed that it does not.

In that case, in sequence (129), $(\text{her aunt})_{caus}$ may simultaneously trigger the thought of the expectation that Joan came in time because of her aunt and the thought of the observation that she did not.

Sequence (134) is more complex in that it appears to involve not two but three causal relationships: (1) the general expectation that fatigue causes sleep; (2) the specific expectation that fatigue does not cause sleep in the protagonist's case, and (3) the specific observation of a situation in which the general expectation has gained the upper hand.

But the actual sentence (130) does not refer to the observed situation. As far as sentence (130) in sequence (134) is concerned, the hearer is required to accommodate only two incompatible situations under a single umbrella $\hat{\boldsymbol{S}}$: the general expectation that fatigue causes sleep and the specific expectation that it does not so as far as the protagonist is concerned. The specific observed situation of his sleeping is only added in the next sentence.

Thus, in sequence (134), (he is tired)$_{caus}$ can be viewed as a regular counterpart of (her aunt)$_{caus}$ in (129). It triggers the *general* expectation that the protagonist sleeps, i.e. ***s*** causes ***S***, which is overridden by the *more specific* expectation that the cause does not work in the case of the present protagonist. So sentence (130) in sequence (134) does not require a special IF; it can be treated as another instance of IF **D**, opposing two expected situations instead of an expected situation and an observed one.

All in all, it can be concluded that the position of the terminal N-boundary $^{N}|$ in an SR is semantically relevant in Hajičová's sense. Moving it between the final position and penultimate position in an SR switches the appropriate IFs between **D** and **A**.

11.2 *The Scope of Negation in the Topic*

Next, Hajičová checks the available positions for the terminal N-boundary $^{N}|$. She starts out with instances in which $^{N}|$ occurs to the left of $|^{F}$, i.e. where the complete scope of negation is part of the topic. Given constraint (x), this implies that the scope of negation comprises only the verb.

In SR (122) of sentence (78), which fits in FN-template (74) and imposes itself in sequence (123), the scope of negation has moved out of the focus. Similarly, Hajičová adduces SR (137) for sentence (130), as imposed by sequence (138).[33]

(137) [(he)$_{ag}$ $|^{N}$ sleep.PRS $^{N}|$ $|^{F}$ (he is tired)$_{caus}$]

(138) "Why hasn't Paul yet got asleep? He has been skating the whole afternoon and *he doesn't sleep because he is tired*."

Hajičová observes that SR (137) fits IF **A**; cf. SR (133) of sentence (130). But, she notes, SR (122) and SR (120) of sentence (78), in which the verb belongs to the focus, also fit IF **A**. This prompts her assumption that, if the verb makes

33 SR (137) is (15′) on H88. Sequence (138) is (15) on H88.

up the scope of negation, no different "meanings" (i.e. inferences) occur depending on whether the verb is inside or outside the focus in the SR (H88): FN-templates (69) and (74) correspond to the same IF.

This may be the case when $n = 2$, i.e. when the sentence contains only two arguments. But Hajičová points out that matters are different when $n \geq 3$, more particularly when two or more constituents follow the verb in the CD, as in template (39). She introduces sentence (139), which is structurally identical to sentence (103) but allows for more transparent inferential framing.[34]

(139) I don't know any poems by X.Y. because I rarely read POETRY.

According to Hajičová, sentence (139) allows for SR (140), which has the same structure as (122) except that the non-negated focus includes an object besides a causal adjunct.[35]

(140) $[(\text{I})_{ag} |^{\text{N}} \text{know.PRS} ^{\text{N}}| |^{\text{F}} (\text{any poems by X.Y.})_{pat} (\text{I rarely read poetry})_{caus}]$

Hajičová observes that SR (140) occurs when "the speaker assumes the existence of poems written by X.Y. and states the reasons for his ignorance" (H88). This implies the introduction of yet another inferential frame, viz. E.

E – Situation ***S*** does not exist.
– Situation ***s*** exists.
– The *cause* of the non-existence of situation ***S*** is the existence of ***s***.
– The *patient* that takes part in situation ***S*** exists.

IF E represents an innovation in as far as it includes reference to the existence of specific participants in situations, i.e. not just to the existence of situations that are causes of situations. IF E imposes itself in Hajičová's sequence (141), which contains sentence (139).[36]

34 Sentence (139) is (16) on H88. Hajičová's phrasing of the causal adjunct in sentence (139) varies: first she writes *... I don't read POETRY* (*very*) *much* ((16) on H88); further on it is *... I don't read much poetry* ((18) on H88). In order to reduce the possibility of confusion resulting from irrelevant accumulation of clauses containing a negation, the clause has been replaced by *... I rarely read poetry* in the present exercise.

35 SR (140) is (17′) on H88.

36 Sequence (141) is (17) on H88.

(141) "It seems you know everything concerning Australian literature or is there something you don't know? *I don't know any poems by X.Y. because I rarely read poetry*."

If IF **E** applies, sentence (139) is covered by FN-template (142).[37]

(142) $[(A_1)\ |^{N}\ V\ ^{N}|\ |^{F}\ (A_2)\ (A_3)]$

Hajičová confronts SR (140) of sentence (139) with SR (143), which fits FN-template (144).[38]

(143) $[(\text{I})_{ag}\ |^{F}\ |^{N}\ \text{know.PRS}\ (\text{any poems by X.Y.})_{pat}\ ^{N}|\ (\text{I rarely read poetry})_{caus}]$

(144) $[(A_1)\ |^{F}\ |^{N}\ V\ (A_2)\ ^{N}|\ (A_3)]$

SR (143) is supposed to occur when (139) is used in sequence (145).[39]

(145) "Would you tell me something about the works of Australian writers? They wrote first of all short stories and novels, some of them even poems. … *I don't know any poems by X.Y. because I rarely read poetry.* If he wrote any at all they have escaped my attention."

For this case, Hajičová introduces the idea of what may be called *suspended inference*. Suspended inference presupposes an IF in which the existence of a participant in a situation, such as the poems by X.Y., is neither confirmed nor denied: "the assumption that X.Y. wrote poetry is not necessary" (H88). This implies that there is another possible IF **F** for SR (143).

F – Situation ***S*** does not exist.
– Situation ***s*** exists.
– The *cause* of the non-existence of situation ***S*** is the existence of situation ***s***.
– The *patient* that takes part in situation ***S*** exists or does not exist.

IF **F** imposes itself in sequence (145).

37 FN-template (142) is (17′) on H88.
38 SR (143) is (18′) on H89.
39 Sequence (145) is an adaptation of (18) on H88.

Hajičová concludes that the fact that SR (140) and SR (143) correspond to different IFs proves that the relative positions of |^{F} and ^{N}| are semantically relevant. If the poems by X.Y. are outside the scope of negation, it is inferred that they exist; if they are inside it, their existence is suspended.

Note that suspended inference has been around all along. As an example, the existence of situation ***s*** is also suspended in IF **B**. In fact, for any sentence an endless list of suspended inferences can be made up. We shall not deal with the problem here, except for a few remarks at the end of this paper.

Note, moreover, that IFs **E** and **F** are typically found with verbs like *know*, *see*, *wait*, etc. The patients of such verbs may either be present or absent in the situation of not knowing, seeing, etc. If they are present without being known, seen, etc., they are *referential* (cf. Padučeva 2006, especially 34ff.): they are "inner" participants of the situation ***S*** referred to by the verb. If they are not present in the situation, they are part of a conceptually distant situation ***s***, whose relationship with the speech situation or other situations that the speaker has either been conjured up already, or is intended to remain unspecified. (Both options imply an instruction to the hearer to refrain from changing his attention focus in processing the rest of the message.)

Thus, the objects of verbs of knowing, etc. may share a property with adjuncts of cause, viz. their belonging to an outer situation with respect to the situation being communicated. Hajičová introduces the distinction between inner and outer participants of an evoked situation later (see 11.3.2.2).

11.2.1 The Verb Is in the Topic and in the Scope of Negation

Comparing SR (140) and SR (143) takes Hajičová to the following statement on instances in which the verb is in the scope of negation and the topic, i.e. instances of incomplete FN-template (116).

> If the verb is contextually bound and the negation is before the verb, then the end of the scope of negation is immediately after the verb, i.e. at the boundary between the contextually bound and the contextually non-bound part of the sentence. (H89)

This implies constraint (xii).

(xii) If the verb is in the topic and in the scope of negation, then the scope of negation does not overlap with the focus and contains just the verb.

Or, in terms of FN-templates:

(146) (xii) $[(A_1) \ldots (A_i) \,|^{N}\, V \,|^{F}\, (A_{i+1}) \ldots (A_n)]$ implies
$[(A_1) \ldots (A_i) \,|^{N}\, V \,{}^{N}|\, |^{F}\, (A_{i+1}) \ldots (A_n)]$

Constraint (xii), which rules out FN-template (75), is no novelty as it is already implied by constraints (v) and (x); constraint (v) stipulates that the focus starts either immediately before or immediately after the verb, while constraint (x) stipulates that the verb is the only constituent in the topic that can be negated: so (xii) is what you get when you assume, as Hajičová does, that the verb is either the most dynamic contextually bound element or the least dynamic contextually non-bound element.

As we saw in 10.1, the empirical basis for these constraints is open to discussion. More specifically, constraint (xii) rules out SR (147), which seems to be the natural way to account for sentence (139) in sequence (148).

(147) $[(\text{I})_{ag} \,|^{N}\, \text{know.PRS (any poems by X.Y.)}_{pat} \,{}^{N}|\, |^{F}\, \text{(I rarely read poetry)}_{caus}]$

(148) "You know so much about Australian literature. How come you don't know any poems by X.Y.? *I don't know any poems by X.Y. because I rarely read poetry*."

It makes sense, on the other hand, to rule out SR (149).

(149) $[(\text{I})_{ag} \,|^{N}\, \text{know.PRS} \,|^{F}\, \text{(any poems by X.Y.)}_{pat} \,{}^{N}|\, \text{(I rarely read poetry)}_{caus}]$

From the perspective of functional sentence perspective, SR (149) would imply that new information is communicated on a known negated event: a speaker directs the hearer's attention to a known situation A' that is characterized by the absence of another situation A, in order to modify the hearer's attention or knowledge with new information about A'. This does not make sense. Pragmatically speaking, the stratified situation A has served its purpose after identifying A': there is no point in informing the hearer about it any further.

11.2.2 The Verb Is in the Topic and Outside the Scope of Negation

Hajičová's next constraint (xiii) deals with instances of incomplete FN-template (117).

> If the verb is contextually bound and the negation is after the verb, then the end of the scope of negation is at the end of the sentence. (H89)

(xiii) If the verb constituent is in the topic and in the complement, then the scope of negation and the focus coincide.

I.e. in terms of FN-templates:

(150) (xiii) $[(A_1) \ldots (A_i)\ V\ |^{F}\ |^{N}\ (A_{i+1}) \ldots (A_n)]$ entails
$[(A_1) \ldots (A_i)\ V\ |^{F}\ |^{N}\ (A_{i+1}) \ldots (A_n)\ ^{N}|]$

If, in a sentence containing a negation, the verb constituent is both in the topic and in the complement, we are dealing with constituent negation. The constraint implies that constituent negation can only affect all constituents in the focus simultaneously. As a result, for incomplete FN-template (117), the position of $^{N}|$ is fixed at the end of the sentence.

Constraint (xiii) is intended as an empirical constraint. Hajičová introduces it without any discussion or examples. Its empirical validity will be discussed in section 15.

Until further notice, constraints (xii) and (xiii) will be adopted. This implies that the position of the terminal N-boundary is fully determined by the other boundaries as long as the verb constituent is in the topic: if the verb constituent is in the scope of negation, it is the only constituent in the scope of negation; if the verb constituent is not in the scope of negation, all the constituents to its left in the CD are in the scope of negation.

11.3 *The Scope of Negation in the Focus*

As a result of the above constraints, the position of the terminal N-boundary is fully predictable when the initial N-boundary is in the topic, i.e. for incomplete FN-templates (116) and (117).

Hajičová now turns to instances in which the verb constituent is in the focus. Here, too, there are two available options: the verb constituent may be outside or inside the scope of negation.

11.3.1 The Verb Is in the Focus and Outside the Scope of Negation

Hajičová's next constraint deals with incomplete FN-template (118), in which the verb is inside the focus and outside the scope of negation. Hajičová claims that (118) simply does not occur:

> If the verb is contextually non-bound, the operator of negation is always before the verb [...]. (H89)

(xiv) If the verb is in the focus, it is also in the scope of negation.

Constraint (xiv), which rules out FN-template (71), tightens up constraint (xi), which already banned the initial N-boundary |N between arguments of the verb in the focus. As an example of the type of SR that is banned by constraint (xiv), consider SR (151).

(151) [(I)$_{ag}$ |F know.PRS |N (any poems by X.Y.)$_{pat}$ N| (I rarely read poetry)$_{caus}$]

While constraint (xi) is intended as an empirical constraint, no reasons are given why constraint (xiv) should apply. Its validity will be discussed in section 15.

11.3.2 The Verb Is in the Focus and in the Scope of Negation

If we accept all of Hajičová's constraints that have been introduced so far, there is only one incomplete FN-template in which the end of the scope of negation is not fully predictable. Incomplete FN-template (119) has so far resisted all attempts to fix the position of the terminal N-boundary:

> If the verb is contextually non-bound [...], the end of the scope of negation is either at the end of the sentence or before some participant. (H89)

In other words, Hajičová allows for the existence of two complete FN-templates corresponding to incomplete FN-template (119), viz.:

(152) [(A_1) ... (A_i) |F |N V (A_{i+1}) ... (A_n) N|]

(153) [(A_1) ... (A_i) |F |N V (A_{i+1}) ... (A_j) N| (A_{j+1}) ... (A_n)]

These FN-templates include the typical cases of sentence negation, such as SR (120) or SR (127): when both the F-boundary and the initial N-boundary occur before the verb constituent, the terminal N-boundary is unpredictable.

So as to curb this unpredictability, Hajičová explores different types of constraint on the position of the terminal N-boundary.

11.3.2.1 *The Terminal N-Boundary and Communicative Dynamism*

As a first step, Hajičová suggests that N| can only occur "before the participant with the highest degree of communicative dynamism" (H89). This produces constraint (xv).

(xv) If the verb is in the focus, the end of the scope of negation is adjacent to the last constituent.

In other words, only the last constituent is allowed to shirk negation. In terms of FN-templates, constraint (xv) may run as follows.

(154) (xv) $[(A_1) \ldots (A_i) \,|^{F}\,|^{N}\, V\, (A_{i+1}) \ldots (A_j)\, {}^{N}|\, (A_{j+1}) \ldots (A_n)]$ entails $j + 1 = n$.

Thus, whereas SR (143) is allowed for sentence (139), SR (155) is not.

(155) $[(\text{I})_{ag}\, |^{F}\, |^{N}$ know.PRS ${}^{N}|$ (any poems by X.Y.)$_{pat}$ (I rarely read poetry)$_{caus}]$

Similarly, SR (156) is allowed for sentence (103), whereas SR (157) is not.

(156) $[(\text{Mother})_{ag}\, |^{F}\, |^{N}$ scold.PST (her daughter)$_{pat}$ ${}^{N}|$ (the father)$_{caus}]$

(157) $[(\text{Mother})_{ag}\, |^{F}\, |^{N}$ scold.PST ${}^{N}|$ (her daughter)$_{pat}$ (the father)$_{caus}]$

Constraint (xv) is an empirical constraint: Hajičová reports that it is based on a sample of Czech sentences from Šmilauer's syntax (Šmilauer 1966², 169–355), which she analysed for her dissertation (Hajičová 1975, 91–92). Whether the constraint applies under any circumstances, requires further investigation. Consider sentence (158), which is an extension of (103).

(158) Mother did not scold her daughter because of the father on SUNDAYS.

Here the constituent (the father)$_{caus}$ is likely to be interpreted as part of the topic: the sentence is appropriate in sequence (159), where it corresponds to SR (160).

(159) "Is it on Mondays that Mother didn't scold her daughter because of the father? No, *Mother did not scold her daughter because of the father on Sundays.*"

(160) $[(\text{Mother})_{ag}$ (her daughter)$_{pat}$ (the father)$_{caus}\, |^{N}$ scold.PST ${}^{N}|\, |^{F}$ (Sundays)$_{temp}]$

Yet, there does not seem to be a fundamental reason why SR (161), in which two constituents are excluded from the scope of negation, should be banned categorically: consider sequence (162).

(161) $[(\text{Mother})_{ag}\, |^{F}\, |^{N}$ scold.PST (her daughter)$_{pat}$ ${}^{N}|$ (the father)$_{caus}$ (Sundays)$_{temp}]$

(162) "Didn't Mother ever give any of the children a break, if only because of her own parents? Well, *Mother didn't scold her daughter because of the father on Sundays*."

11.3.2.2 *The Terminal N-Boundary and Constituent Properties*

So as to reduce the freedom of the terminal N-boundary $^{N}|$ in incomplete FN-template (119) even further, Hajičová imposes restrictions as to the type of constituent following it.

She splits the constituents depending on the verb into two categories, which will be labelled A^I and A^F. Type A^I comprises what she calls *intentional* (or *close*, or *necessary*) *modifications*; type A^F contains the so-called *free modifications*. (H89)

Apparently, intentional modifications are constituents that fill valences of the verb, i.e. "inner" participants such as subjects and direct and indirect objects. Their participation in the situation that the speaker conjures up is implied by the verb; the function of the elements that signify them is specifying the actants that perform roles that are defined by the verb.

Free modifications, on the other hand, are adjuncts, "outer" participants, which add specifications but can be omitted, such as expressions of time and place. Thus:

(163) $A^I = \{A_g, A_{rec}, A_{pat}, \ldots\}; A^F = \{A_{caus}, A_{loc}, A_{temp}, \ldots\}$

As Hajičová reports, her investigations of the sample of Czech sentences have shown that the end of the scope of negation does not occur before intentional modifications (H89).[40] This implies empirical constraint (xvi).

(xvi) If the terminal boundary of the scope of negation does not coincide with the end of the focus, the last constituent is a free modification.

Or in terms of FN-templates:

(164) $[(A_1) \ldots (A_i)\ |^{F}\ |^{N}\ V\ (A_{i+1}) \ldots (A_{n-1})\ ^{N}|\ A_n]$ entails $A_n \in A^F$.

This rules out SRs (166) and (167) for sentence (165): only SR (168) is acceptable. Cf. also SRs (143) and (156), in which $^{N}|$ separates an intentional modification from a free modification as allowed by constraint (xvi).

40 Hajičová applies the constraint to "the so-called intentional (close, necessary) modification" (H89). Since a verb may have more than one intentional modification in the focus, as in sentence (165), the plural appears to be more appropriate.

(165) John didn't give Mary the BOOK.

(166) [(John)$_{ag}$ |^{F} |^{N} give.PST ^{N}| (Mary)$_{rec}$ (the book)$_{pat}$]

(167) [(John)$_{ag}$ |^{F} |^{N} give.PST (Mary)$_{rec}$ ^{N}| (the book)$_{pat}$]

(168) [(John)$_{ag}$ |^{F} |^{N} give.PST (Mary)$_{rec}$ (the book)$_{pat}$ ^{N}|]

The question remains whether the constraint holds. Consider Hajičová's sentence (169).[41]

(169) Harry didn't cause our DEFEAT.

According to Hajičová, sentence (169) allows for inferences that are "analogous" to those for sentence (78) (H85). Although no details are provided, it seems safe to assume that two inferences must be distinguished: (170) and (171).

(170) 'We suffered a defeat but Harry did not cause it.'

(171) 'Harry caused something which was not our defeat.'

Inference (170) must be assumed to correspond to IF **A**. Inference (171) must be assumed to correspond to IF **B** and will not interest us here.

Analysis of the possible inferences is complicated insofar as the arguments of the verb constituent are mixed up between sentence (78) and sentence (169): in the latter sentence the ***S*** is characterized as a causing situation while the ***s*** is expressed by the object; also ***s*** is the prospective result of ***S*** instead of its cause. Due to these role shifts, a new IF **G** must be formulated.

G – Situation ***S*** does not exist.
– Situation ***s*** is the *patient* of situation ***S***.
– Situation ***s*** exists.

Under IF **A**, sentence (78) may correspond to SR (120) or SR (122): the constituent (his wife was ill)$_{caus}$ is outside the scope of negation. If we go along with Hajičová's analogy, we must make the same assumption for a defeat that has not occurred. In that case, sentence (169) correlates to SR (172).

41 Sentence (169) is (5)(a) on H85.

(172) [(Harry)$_{ag}$ |F |N cause N| (our defeat)$_{pat}$]

According to constraint (xvi), this is allowed only if *our defeat* is a free modification, i.e. can be omitted. This is obviously not the case: the verb *cause* normally requires its object to be specified. Consequently, (xvi) does not look like an empirical constraint. It rather seems to result from the convention to handle intentional modifications within the scope of negation in the case of sentence negation, irrespective of their existence (cf. the discussion on SR (143)), i.e. to allow FN-template (164) only for $A_n \in A^F$.

11.3.2.3 *The Terminal N-Boundary and Free Modification*

As a result of the constraints that Hajičová has introduced so far, the position of the terminal N-boundary in an SR can be predicted when the positions of the initial F- and N-boundaries are known, except for instances of sentence negation containing a free modification with the highest degree of communicative dynamism. Only this free modification can be either inside the scope of negation or make up the second leg of a split complement.

Hajičová strives to reduce this uncertainty even further by distinguishing various types of free modification, i.e. by looking inside A^F as defined in 11.3.2.2. She distinguishes adverbials of *cause*, adverbials of *manner*, *predicative complements* (*doplněk*) and a residual category (H89) and assesses the likeliness of their occurring outside the scope of negation.

As expected, adverbials that mark *causes* in the broad sense of the term are typically susceptible to scope of negation ambiguity. One of Hajičová's examples is found in sentence (173), as an answer to an open question, e.g. *Co je nového?* 'What's the news?', assuming SR (174).[42]

(173) Děti ne-šly dva dny do školy na základě
children not-go.PST.PL two days to school on basis
výnosu ministerstva ŠKOLSTVÍ.
decision.GEN ministry.GEN education.GEN
'The children didn't go to school for two days on the strength of a decree of the ministry of education.'

(174) [(children)$_{ag}$ |F |N go.PST (school)$_{dir}$ (2 days)$_{dur}$ N| (decree … education)$_{caus}$]

Hajičová is less sure about the other categories: the end of the scope of negation occurs "perhaps also before some adverbials of manner […] and the pred-

42 Sentence (173) is (25) on H90.

icate complement" (H89). Here are two examples, also to be read as answers to open questions.[43]

(175) Ne-zkažíš to – tím že prijdeš
not-spoil.PRS.2.SG it PROCLAUSE.INS that come.2.SG
VČAS.
in_time
'You won't spoil it, by coming in time.'

(176) [(you)$_{ag}$ |^{F} |^{N} spoil.PRS (it)$_{pat}$ ^{N}| (coming in time)$_{man}$]

(177) Ne-vracejí se, otřeseni ÚLEKEM.
not-return.PRS.3.PL REFL shocked fright.INS
'They do not come back, shocked by fright.'

(178) [(they)$_{ag}$ |^{F} |^{N} return.PRS ^{N}| (shocked by fright)$_{predcom}$]

Hajičová's residual category includes adverbial expressions indicating location. One of her examples is sentence (179).[44]

(179) Ne-bydlí se mi zrovna dobře, V
not-live REFL I.DAT exactly well in
PANELÁKU.
prefabricated_high-rise
'My living conditions aren't exactly comfortable in a prefab high-rise.'

Here the non-negated last constituent evidently represents a kind of afterthought, which can be set apart from the rest of the sentence. Hajičová views this as the key for predicting the terminal N-boundary in an SR even in instances of incomplete FN-template (119).

11.3.2.4 *Revising the Topic-Focus Articulation*

Finally, Hajičová proposes a reanalysis of the topic-focus division of the problematical sentences as a way to achieve full predictability of the terminal N-boundary.

She suggests that SRs in which the terminal N-boundary and the end of the focus do not coincide, such as SR (120) for sentence (78), are not based on

43 Sentence (175) is (20) on H89. Sentence (177) is (19) on H89.

44 Sentence (179) occurs in Hajičová 1975, 92 and is a part of (24) on H90.

a correct topic-focus analysis. Under IF **A**, Hajičová argues, we are no longer dealing with an SR of a simple sentence. Citing Šmilauer 1966[2], 257, she suggests that, for each of the sentences discussed in 11.3.2.3, there is a paraphrase in which the last constituent in the CD is separated from the rest of the sentence by an expression that turns it into a separate clause: *a to* in Czech, *a imenno* in Russian, *which is* or *this is* in English (H90). Consider sentence (180), which should render sentence (179) in English.[45]

(180) I don't live very comfortably IN A SKYSCRAPER.

Hajičová views *in a skyscraper* as "a sort of intermediate type between subordination and coordination" (H90). Sentence (180) can be paraphrased as (181).

(181) I don't live very comfortably, viz. in a skyscraper.

Similarly, sequence (182) (cf. example (26) on H90) may be assumed to be a paraphrase of sentence (78) under IF **A**.

(182) John didn't come; this is because his wife was ILL.

According to Hajičová, this effectively turns sentence (78) into two sentences, or rather into the product of the transduction of two consecutive SRs, each SR with its own topic-focus division. The SRs can be denoted as the double SR (183) or, if one wishes, (184).[46]

(183) $[(\text{John})_{ag}\ |^{F}\ |^{N}\ \text{come.PST}\ ^{N}|][(\text{John})_{ag}\ |^{N}\ \text{come}\ ^{N}|\ |^{F}\ (\text{his wife was ill})_{caus}]$

(184) $[(\text{John})_{ag}\ |^{F}\ |^{N}\ \text{come.PST}\ ^{N}|][(\text{this})_{ag}\ \text{is}\ |^{F}\ (\text{his wife was ill})_{caus}]$

Hajičová assumes that the transduction rules of FGD take care of merging (183) or (184) by removing the topic of the second SR on the way to the single surface

45 Sentence (180) is Hajičová's translation of an adapted version (both given under (24) on H90) of the Czech sentence (179) that was used in Hajičová 1975, 92. Besides the substitution of *věžák* 'skyscraper' for *panelák* 'prefabricated high-rise', two features of the original sentence are lost in its translation: the choice, in Czech, for a reflexive construction, which turns the agent of 'live' into an experiencer of conditions of living, and the fact that Czech, unlike English and Russian, imposes a lexical choice between 'be alive' *žíti* and 'dwell' *bydlíti*, which is normally avoided by English *live* and Russian *žit'* 'live'. See 15, where sentence (180) will be revisited.

46 SRs (183) and (178) replace Hajičová's lengthy examples (27) and (26) on H90.

sentence (H90). Eventually, the rules must produce a sentence that coincides with sentence (78).

Since the two SRs in (183) or (184) may also generate separate sentences, as in sequence (182), the merger is not automatic: apparently the relevant transduction rule is optional. This suggests that, at this point, Hajičová has abandoned her preference to account for all of the semantics of a sentence in its SRs, i.e. to leave no room for optional transduction rules. We shall return to this point in 13.1.

After substituting SR (183) or (184) for SR (120) of sentence (78) under IF **A**, the first halves of (183) and (184), which contain the negation, cannot be distinguished from the expected SR of sentence (185), viz. SR (186).

(185) John didn't come.

(186) [(John)$_{ag}$ |^{F} |^{N} come.PST ^{N}|]

In (186), the position of the terminal N-boundary is fully predictable.

So, as a result of splitting up SRs in which the initial N-boundary and the F-boundary coincide and the terminal N-boundary does not coincide with the end of the SR, the issue that started the exercise has vanished. Hajičová's substitution of SRs fitting FN-template (153), such as SR (120), by pairs of SRs of simpler types, as illustrated in (183) and (184), boils down to a constraint stipulating that SRs fitting (153) do not exist. What remains is the homonymy of sentences like (78); hence, transduction rules do not only operate on individual SRs but also take care of merging of consecutive SRs into a single surface sentence.

12 Rounding up and Simplifying the Constraints

Once the problem of split complements, i.e. of the non-negated last constituents of the focus, has been disposed of, matters become quite simple.

Hajičová concludes that the position of the terminal N-boundary in an SR always follows automatically from the relative positions of three elements: the F-boundary, the initial N-boundary and the verb constituent. This yields six different technically possible patterns, which Hajičová enumerates in a matrix (H90).[47]

47 In the matrix on H90, *V* stands for *V*, *Neg* for |^{N} and the slash / for the F-boundary |^{F}. Hajičová's use of the slash for |^{F} in the matrix is somewhat puzzling for the unsuspecting reader since elsewhere in the article the slash is used for the terminal N-boundary ^{N}|.

(187) $|^{F}\,|^{N}\,V$ (= Hajičová's (vi)) (= incomplete FN-template (119))

(188)* $|^{N}\,|^{F}\,V$ (= Hajičová's (iv))

(189) $V\,|^{F}\,|^{N}$ (= Hajičová's (iii)) (= incomplete FN-template (117))

(190)* $V\,|^{N}\,|^{F}$ (= Hajičová's (i))

(191) $|^{F}\,V\,|^{N}$ (= Hajičová's (v)) (= incomplete FN-template (118))

(192) $|^{N}\,V\,|^{F}$ (= Hajičová's (ii)) (= incomplete FN-template (116))

Four patterns correspond to the four incomplete FN-templates (116) through (119) as identified in section 11.

The starred patterns (188)* and (190)* are left out of consideration: in view of the constraints that only allow $|^{F}$ and $|^{N}$ in positions that are adjacent to the verb, they must be notational variants of (187) and (189), respectively (H90–91).[48]

Pattern (191) corresponds to incomplete FN-template (118). Hajičová repeats that it does not occur: it is banned by constraint (xiv), which stipulates that the verb must be in the topic if the scope of negation starts only after it. As will be discussed in section 15, constraint (xiv) may be unwarranted. But Hajičová adds:

> If further empirical investigations show that such an assumption does not hold in full, even such cases as [(191)] can be described in the frame of our hypothesis on the scope of negation. (H91)

Patterns (187), (189) and (192) are manifest in several examples given in the present article.

(a) Pattern (187) is found in SRs (127), (135), etc.
(b) Pattern (189) is found in SRs (106), (108), (113), (114), etc.
(c) Pattern (192) is found in SRs (122), (137), (140), (157), (160), etc.

Hajičová surmises that two constraints are now sufficient to predict the position of the terminal N-boundary $^{N}|$ (H90).

Constraint (xvii) applies to patterns (187) and (189).

48 Or as Hajičová puts it: "Cases (i) and (iv) can be excluded on the grounds that in the scope of negation there would not be any member of the sentence […]." (H90).

(xvii) If the initial boundary of the scope of negation $|^{N}$ coincides with the initial boundary of the focus $|^{F}$, the terminal boundary of the scope of negation $^{N}|$ coincides with the terminal boundary of the focus and, consequently, with the end of the sentence.

This merges constraints (xiii) and (xiv): constraint (xiii) ruled that $^{N}|$ coincides with the end of the focus when $|^{F}$ and $|^{N}$ follow the verb. Constraint (xiv) ruled that $|^{N}$ and $|^{F}$ coincide when $|^{F}$ precedes the verb. Constraints (xv) and (xvi) can be removed since the SRs to which they apply do no longer exist.

Constraint (xviii) applies to pattern (192).

(xviii) If the initial boundary of the scope of negation $|^{N}$ is located before the initial boundary of the focus $|^{F}$, the terminal boundary of the scope of negation $^{N}|$ coincides with the initial boundary of the focus $|^{F}$.

This is a repetition of constraint (xii), except that it does not explicitly require that, in the case of constituent negation, the verb is the only constituent in the topic. In other words, constraint (x) is ignored.

So Hajičová's goal has been attained. Using two simple rules, it is possible to predict the position of the terminal N-boundary knowing the positions of the initial F- and N-boundaries.

13 Amendments

In what follows below, two amendments to Hajičová's results are suggested, aiming to illustrate and explore the potential of functional generative description.

13.1 *Revising Contextual Boundness*

The first amendment pertains to the way of dealing with sentences with split complements, like (78). As we saw in 11.3.2.4, Hajičová eventually solves the problem of the non-negated last constituent of the focus by turning it into the remainder of an underlying separate second sentence, and applying constraint (xvii) only to the underlying first sentence.

The price to be paid for this solution consists in the renewed introduction of optional transformations Hajičová (H81) subscribes to the view that transformations preserve meaning, referring to Partee 1971. This implies the assumption that there are no optional transformations since all semantic distinctions that might trigger them are taken care of in the SR. In FGD terminology, this

means that there are no optional transduction rules between the SR and the surface sentence.

If transduction rules are to preserve meaning, two different sentences cannot result from the same SR. When we find that two different sentences in a language go back to the same SR or series of consecutive SRs, somewhere on the way to the surface a choice between them must have been made. If both sentence (78) and sentence (182) go back to the same (double) SR, whether (183) or (184), at least one of the transduction rules involved must be optional.

This can be avoided by encoding the merger of the consecutive sentences in the SRs as well. This in turn requires a slightly different look at the pragmatics of contextual boundness and communicative dynamism.

When adducing the contextually bound constituents of a sentence, a speaker appeals to the hearer to raise his awareness of the elements in his frame of reference with respect to which the message is intended to effect a mutation. The contextually non-bound elements, on the other hand, are new ideas, which the speaker instructs the hearer to associate with the contextually bound ones.

It may be assumed, however, that a hearer's awareness changes in the course of processing an utterance. While processing an utterance, a hearer converts incoming new elements into given elements with respect to the next elements to be processed. This is the principle of communicative dynamism.

It may be assumed, furthermore, that a speaker is aware of the fact that the information that is processed at one point of the focus is available to be used as a part of the topic before the processing of the utterance has been completed, and takes advantage of it.

It may also be assumed that languages offer devices that facilitate such instant topicalization of new information, not just between sentences but also inside them. Such devices may include deictic categories and ways to articulate sentences into manageable chunks.

As a consequence, even if the principle of a binary topic-focus articulation is sustained, languages may be equipped with more or less standardized tools for *recursive articulation*, in which chunks of focus are converted into chunks of topic on a real-time basis. They might enable a speaker to identify a focus ***F*** and almost simultaneously conjure up another, superimposed, focus ***F′*** for which ***F*** serves as a topic. In an analogy with the pragmatics of negation that was introduced in 2.1, such a device might be referred to as *focus stratification*.

Focus stratification is, then, the instruction to the hearer to convert the incoming focus into the topic for the next incoming focus. Its formal correlate may consist of prosodic contours that are too sophisticated to be rendered in written text by means of occasional capitalized constituents.

A stratifying focus could be rendered in the SR of a sentence by an indexed F-boundary $|^{F'}$: this creates a *bifocal* sentence.

Bi- and multi-focal SRs do not necessarily contain negations. But if they do, Hajičová's SRs in which the terminal N-boundary does not coincide with the end of the focus (i.e. FN-templates (69), (144), etc.) can be replaced by bifocal SRs that fit FN-template (193).

(193) $[(A_1) \ldots (A_i) |^{F} |^{N} V (A_{i+1}) \ldots (A_{n-1}) {}^{N}| |^{F'} (A_n)]$

Here are two examples. SR (120) is replaced by SR (194); SR (143) is replaced by SR (195).

(194) $[(\text{John})_{ag} |^{F} |^{N} \text{come.PST} {}^{N}| |^{F'} (\text{his wife was ill})_{caus}]$

(195) $[(\text{I})_{ag} |^{F} |^{N} \text{know.PRS} (\text{any poems by X.Y.})_{pat} {}^{N}| |^{F'} (\text{I rarely read poetry})_{caus}]$

Adopting this approach discards the need of splitting SRs and having to take recourse to optional transduction rules.

13.2 *Revising the Negated Topic*

As a second amendment, it is proposed to dispose of constraint (x), which rules that the verb is the only constituent in the topic that can be part of the scope of negation.

As discussed in 10.1, it is simple to find counterexamples, which can only be disposed of by rearranging the order of the constituents so as to land the verb in the last position of the topic.

This produces an arrangement of the constituents that does not intuitively reflect the order of communicative dynamism: in the case of SR (100) of sentence (96) under IF **A**, it is hard to explain why the constituent $(\text{a cold})_{pat}$ should be outside the scope of negation $|^{N}$ catch.PST $^{N}|$ while it is likely to end up in the scope of negation if the verb is in the focus, as in a plausible SR (197) for sentence (196).

(196) He did not catch a COLD.

(197) $[(\text{he})_{ag} |^{F} |^{N} \text{catch.PST} (\text{a cold})_{pat} {}^{N}|]$

The proposed revision of contextual boundness in 13.1 produces another reason for disposing of constraint (x). Changing the CD hierarchy of a negated

topic with respect to the hierarchy that it would have if it were in the focus, would dissociate topic negation from focus stratification, whereas the two types of SR are in fact closely related.

Consider, as an example, an instance of sentence (139) in which the verb constituent is in the topic. Constraint (x) requires that the constituent (any poems by X.Y.)$_{pat}$ ends up before the verb constituent, to obtain SR (198).

(198) [(I)$_{ag}$ (any poems by X.Y.)$_{pat}$ |^{N} know.PRS ^{N}| |^{F} (I rarely read poetry)$_{caus}$]

Semantically and pragmatically, however, an instance of a negated topic is closely related to a bifocal SR like (195). Both types of negation share IF **A**. In SR (195) the original focus is stratified into a topic. It is not clear why the minor difference between a negated original topic and a negated instant topic consisting of the same lexical and grammatical material and triggering the same inferences should entail a major overhaul of both the hierarchy of communicative dynamism and the scope of negation. An SR in which the relation between the two sentences is transparent is more plausible: compare SR (199) and SR (195).

(199) [(I)$_{ag}$ |^{N} know.PRS (any poems by X.Y.)$_{pat}$ ^{N}| |^{F} (I rarely read poetry)$_{caus}$]

As a final argument, it may be added that constraint (x) is not really needed. As observed in section 12, Hajičová ignores it when putting forward constraints (xvii) and (xviii), into which the other constraints are conflated.

13.3 *One Rule for Everything*

The above amendments clear the way for further simplification. Hajičová's rules can now be captured in a single, transparent rule that predicts the position of the terminal N-boundary in all cases that Hajičová's constraints allow (and also in some cases that Hajičová excludes, such as SRs in which the scope of negation only starts halfway the focus: see section 15).

(xix) The scope of negation (wherever it starts) ends at the next boundary (whatever its type).

Rule (xix) incorporates the following cases.

(a) If the scope of negation starts in the topic, the terminal N-boundary coincides with the first F-boundary: cf. FN-template (200).

(200) [(A_1) ... (A_i) |^{N} V ^{N}| |^{F} (A_{i+1}) ... (A_n)]

(b) If the scope of negation starts in a focus, the terminal N-boundary coincides with the next focus boundary: cf. FN-template (201).

(201) $[(A_1) \ldots (A_i) \,|^{F} \,|^{N}\, V\, (A_{i+1}) \ldots (A_j)\, {}^{N}| \,|^{F'}\, (A_{j+1}) \ldots (A_n)]$

(c) If the scope of negation starts in the last focus, the terminal N-boundary coincides with the end of the SR: cf. (202).

(202) $[(A_1) \ldots (A_i) \,|^{F} \,|^{N}\, V\, (A_{i+1}) \ldots (A_{n-1})\, {}^{N}|]$

Like the terminal F-boundary, the terminal N-boundary ${}^{N}|$ in an SR is now automatic. Consequently, denoting ${}^{N}|$ in the denotation of an SR has become redundant and will be omitted. Hence, only two types of boundary will be recorded: F-boundaries $|^{F}$, which may be recurrent, yielding $|^{F'}$, $|^{F''}$, etc., and N-boundaries $|^{N}$. FN-template (200) will be denoted as (203), etc.

(203) $[(A_1) \ldots (A_i) \,|^{N}\, V \,|^{F}\, (A_{i+1}) \ldots (A_n)]$

14 Types of Negation as Defined by the Positions of the F- and N-Boundaries

It is tempting to use the positions of the N- and F-boundaries in an SR as a basis for a typology of negation. In fact Hajičová's article implicitly contains a contribution to negation typology by identifying (187), (189) and (192) (i.e. her types vi, iii and ii, respectively) as the basic patterns to be handled by the constraints. They correspond to the classic types of negation that turn up, with various labels, in other analyses, thus confirming that Hajičová's formal approach involving functional sentence perspective makes sense. The three types are the following.

(I) *Sentence negation*, in which the topic coincides with the complement of the scope of negation, while the focus includes the verb and coincides with the scope of negation.

(II) *Constituent negation*, in which the verb is in the topic and outside the scope of negation.

(III) *Topic negation*, which are affirmative sentences in which (a part of)[49] the topic happens to make up a scope of negation.

49 The question as to whether the agent automatically belongs in the complement of the scope of negation (cf. 7.1) remains to be settled.

In addition, the discussions in 13.1 and 9.1 prompt the identification of two more types of negation, which are of a more complex nature.

(IV) *Situation negation with focus stratification*, which combines types (I) and (III): an instance of situation negation is stratified into a negated topic.

(V) *Negation haplology*, which combines types (II) and (III): constituent negation and topic negation.

These types of negation are distinguished on the tectogrammatical level of the semantic representation of a sentence, and can mostly be identified by means of analysing hearers' inferences regarding the existence of constituents and situations as prompted by the contexts and settings of actual utterances.

The transduction rules of a language, however, often cause various types of negation on the tectogrammatical level to coincide at the surface. The transduction rules of the neutral written style of English, which strongly prefers *do not* constructions, thus avoiding extraction and other syntactic means of marking the focus and/or the scope of negation, present a telling example. In some circumstances, they syncretize types (I) through (IV) in the surface structure. As discussed in 9.1, some speakers even syncretize all five types. So a single negative sentence, say (204) below, may be generated from five SRs that differ only in the positions of their F- and N-boundaries.

(204) John did not drink wine because his wife ordered BAROLO.

Each type of negation will be illustrated in the next sections, along with:

(a) its defining FN-template;

(b) its corresponding semantic representation for sentence (204);

(c) the inferential frame that allows it;

(d) a specific inference for an occurrence of the sentence that fits the inferential frame;

(e) a sequence providing a context that is likely to trigger the inference.

14.1 *Type I: Sentence Negation*

Logicians tend to regard type I as the prototype of negation. Take an affirmative descriptive or narrative sentence and supply it with a negative operator, which qualifies it as a false statement.

In pragmatic terms, these are the sentences that a speaker uses to summon the hearer to imagine a situation or event, causes and all, and subsequently to reject the complete imagined situation: all this in a single sentence.

Type I is regularly found for short sentences with only two or three constituents. Sentence (18) with SR (57) is a typical example. It is much less frequently encountered *in vivo* for sentences with larger numbers of constituents, especially when Hajičová's free modifications are involved, such as causal ad-

juncts and clauses, which is the type of sentence that started her exercise. As we saw in 11.1.2 when discussing SRs (127) and (135), for an example of type I to come across as natural it must be embedded in an elaborate context. Sequence (209) may do for sentence (204).

(a) Defining FN-template:

(205) $[(A_1) \ldots (A_i) \mid^{F} \mid^{N} V (A_{i+1}) \ldots (A_n)]$

(b) Corresponding semantic representation for sentence (204):

(206) $[(\text{John})_{ag} \mid^{F} \mid^{N} \text{drink.PST } (\text{wine})_{pat} \text{ (his wife ordered Barolo)}_{caus}]$

(c) Inferential frame allowing it:

(207) IF **D**:
- Situation ***S*** exists_1.
- The *cause* of the existence_1 of situation ***S*** is the existence_1 of situation ***s***.
- Situation ***s*** exists_2.
- Situation ***S*** does not exist_2.

(d) Specific inference for an occurrence of the sentence fitting the inferential frame:

(208) 'If John drank wine the reason for his drinking wine was his wife's ordering Barolo. John did not drink wine.'

(e) Sequence providing a context that is likely to trigger the inference:

(209) "John had adopted an alcohol-free lifestyle but during the holidays he used to share a bottle with his wife, who loved the local wines. However, this summer he had decided to stick to his principles and no longer allow himself to be tempted just to please his wife. *John did not drink wine because his wife ordered Barolo.* Not anymore."

14.2 *Type II: Constituent Negation*

Having been discussed in 3.1, constituent negation (or *partial* negation) needs no further comment. The constituents to be negated are in the scope of negation and in the focus; the verb is in neither. There is no problem applying type II to sentence (204). Note that $(\text{wine})_{pat}$ comes behind the verb in the topic, following the discussion in 13.2.

(a) Defining FN-template:

(210) $[(A_1) \ldots (A_i)\ V\ |^{F}\ |^{N}\ (A_{i+1}) \ldots (A_n)]$

(b) Corresponding semantic representation for sentence (204):

(211) $[(\text{John})_{ag}\ \text{drink.PST}\ (\text{wine})_{pat}\ |^{F}\ |^{N}\ (\text{his wife ordered Barolo})_{caus}]$

(c) Inferential frame allowing it:

(212) IF **B**:
- Situation ***S*** exists.
- The *cause* of the existence of situation ***S*** is not the existence of situation ***s***.

(d) Specific inference for an occurrence of the sentence fitting the inferential frame:

(213) 'John drank wine. The reason was not his wife's ordering Barolo.'

(e) Sequence providing a context that is likely to trigger the inference:

(214) "I was surprised to see John holding a glass. Did his wife coax him to it by means of a special vintage? – Not really. *John did not drink wine because his wife ordered Barolo.* He was simply fed up with being a teetotaler."

14.3 *Type III: Topic Negation*

The scope of negation and the topic are separate items: the negative fact is known, the new information concerns the cause of its occurrence. No problem applying type III to sentence (204).

(a) Defining FN-template:

(215) $[(A_1) \ldots (A_i)\ |^{N}\ V\ (A_{i+1}) \ldots (A_j)\ |^{F}\ (A_{j+1}) \ldots (A_n)]$

(b) Corresponding semantic representation for sentence (204):

(216) $[(\text{John})_{ag}\ |^{N}\ \text{drink.PST}\ (\text{wine})_{pat}\ |^{F}\ (\text{his wife ordered Barolo})_{caus}]$

(c) Inferential frame allowing it:

(217) IF **A**:
- Situation ***S*** does not exist.
- Situation ***s*** exists.
- The *cause* of the non-existence of situation ***S*** is the existence of situation ***s***.

(d) Specific inference for an occurrence of the sentence fitting the inferential frame:

(218) 'The reason why John did not drink wine was his wife's ordering Barolo.'

(e) Sequence providing a context that is likely to trigger the inference:

(219) "Why didn't John drink even a single glass? He is such an oenophile. – *John did not drink wine because his wife ordered Barolo.* He hates Barolo."

14.4 *Type IV: Negation with Focus Stratification*

Type IV and type III are closely related. They share the same inferences. The difference consists in the topic-focus articulation. In type III the negated fact is considered given: the new information concerns the cause of the negation. Type IV is more complex: the negated fact is presented as new information, while the cause of its negation is added as another piece of new information. Focus stratification (13.1) looks like an adequate way of accounting for that.

(a) Defining FN-template:

(220) $[(A_1) \ldots (A_i) \,|^{F} \,|^{N} V\, (A_{i+1}) \ldots (A_j) \,|^{F'} (A_{j+1}) \ldots (A_n)]$

(b) Corresponding semantic representation for sentence (204):

(221) $[(\text{John})_{ag} \,|^{F} \,|^{N} \text{drink.PST}\, (\text{wine})_{pat} \,|^{F'} (\text{his wife ordered Barolo})_{caus}]$

(c) Inferential frame allowing it:

(222) IF **A**:
- Situation ***S*** does not exist.
- Situation ***s*** exists.
- The *cause* of the non-existence of situation ***S*** is the existence of situation ***s***.

(d) Specific inference for an occurrence of the sentence fitting the inferential frame:

(223) 'John did not drink wine, the reason for his not drinking wine being his wife's ordering Barolo.

(e) Sequence providing a context that is likely to trigger the inference:

(224) "They have such interesting wines there. John must have enjoyed himself. – Not really. *John did not drink wine because his wife ordered Barolo.* He hates Barolo."

14.5 *Type v: Negation Haplology*

Negation haplology occurs when two different situations are negated within a single sentence by a single negative signal: cf. 9.1. Such sentences contain two scopes of negation: one in the topic and one in the comment. The former is an instance of topic negation, i.e. type III; the latter is an instance of constituent negation, i.e. type II. Stratification is not involved: the two negations just happen to occur in the same sentence.

Negation haplology is the type of negation that logicians hate, grammarians ban and native speakers argue about. But its existence, whether legal or illegal, in at least some languages cannot be denied.

(a) Defining FN-template;

(225) $[(A_1) \ldots (A_i) \,|^{N}\, V\, (A_{i+1}) \ldots (A_j) \,|^{F}\, |^{N}\, (A_{j+1}) \ldots (A_n)]$

(b) Corresponding semantic representation for sentence (204):

(226) $[(\text{John})_{ag} \,|^{N}\, \text{drink.PST}\, (\text{wine})_{pat} \,|^{F}\, |^{N}\, (\text{his wife ordered Barolo})_{caus}]$

(c) Inferential frame allowing it:

(227) IF **C**:
- Situation ***S*** does not exist.
- The *cause* of the non-existence of situation ***S*** is not situation ***s***.

(d) Specific inference for an occurrence of the sentence fitting the inferential frame:

(228) 'John did not drink wine, the reason for his not drinking wine not being his wife's ordering Barolo.'

(e) Sequence providing a context that is likely to trigger the inference:

(229) "John did not touch his glass. Didn't he like the wine? – No. *John didn't drink wine because his wife ordered Barolo.* He loves Tuscan wines, but he was still suffering from a hangover."

Thus, each type of negation has its own specific semantic representation and corresponds to a unique inferential frame, with the exception of negated focus (14.3) and focus stratification (14.4), which share IF **A** and differ only in their topic-focus articulation.

15 Negation Involving Pragmatic Presuppositions

It is not unlikely that more types of negation can be found. One source of likely candidates will be explored here.

Hajičová's assumption that pattern (191) does not occur, i.e. the verb constituent cannot be in the focus without being in the scope of negation, will be tested here on Hajičová's sentence (180).

Consider sequence (230).

(230) "I heard you moved to New York. How are your dwelling conditions there? Well, *I don't live very comfortably in a skyscraper*."

In this context, sentence (180) is likely to prompt an SR in which the verb *live* belongs in the topic, since the speaker and the hearer are talking about dwelling conditions. Also *live* can be expected to belong in the complement, since the fact that the speaker lives someplace is not put into question. The arguments following it, *very comfortably* and *in a skyscraper*, should end up in the focus, as they answer the question by providing new information.

Within the focus, however, *very comfortably* naturally belongs in the scope of negation, whereas *in a skyscraper* does not. Using Hajičová's original analysis and notation, which allows independent terminal N-boundaries, this results in SR (231).

(231) $[(\text{I})_{ag}$ live.PRS $|^{\text{F}}$ $|^{\text{N}}$ (very comfortably)$_{man}$ $^{\text{N}}|$ (skyscraper)$_{loc}]$

This violates constraint (xiii), which stipulates that the scope of negation and the focus coincide if the verb is in the topic.

The problem is avoided when adopting the revised topic-focus articulation as proposed in 13.1. The introduction of focus stratification replaces SR (231) by SR (232), which complies to all constraints.

(232) [(I)$_{ag}$ live.PRS |^{F} |^{N} (very comfortably)$_{man}$ |$^{F'}$ (skyscraper)$_{loc}$]

But sentence (180) also challenges constraint (xiv). Consider sentence (180) in sequence (233).[50]

(233) "How are you? *I don't live very comfortably in a skyscraper.*"

Here the question that elicits sentence (180) in sequence (233) is not about dwelling conditions: it is an open question about life in general: in that respect, the sentence starts out as a type I sentence: the difference between sequence (233) and sequence (231) is analogous to the difference between sequence (42) (*What did the professors do? …*) and sequence (43) (*What did the professors sign? …*). So the verb constituent live.PRS must be contextually non-bound. This suggests that it belongs in the focus.

But the hearer's living is not denied: the living goes on in the skyscraper. This should imply that the scope of negation starts only after the verb, producing an N-boundary between live.PRS and (very comfortably)$_{man}$. In Hajičová's original analysis, without focus stratification, this results in SR (234).

(234) [(I)$_{ag}$ |^{F} live.PRS |^{N} (very comfortably)$_{man}$ ^{N}| (skyscraper)$_{loc}$]

SR (234) violates constraint (xiv), which stipulates that the verb is in the scope of negation if it is in the focus.

The revision of the topic-focus articulation that was proposed in 13.1, which replaces SR (234) by SR (235), does change this.

(235) [(I)$_{ag}$ |^{F} live.PRS |^{N} (very comfortably)$_{man}$ |$^{F'}$ (skyscraper)$_{loc}$]

SR (235) resists Hajičová's empirical constraint (xiv): so pattern (191) actually occurs in one of her sentences.

This is not a problem for the rule for everything (xix), which predicts the position of the terminal N-boundary: in SR (235) the scope of negation ends

50 Sequence (233) is (24) on H90.

at the next F-boundary. So Hajičová's statement that, if such cases as (191) turn out to exist, they can be accommodated (cf. section 12) is justified.

Cancelling constraint (xiv) and allowing SR (235) entails the existence of other types of negation besides those presented so far. FN-template (236), which underlies SR (235), does not occur in section 14.

(236) $[(A_1) \ldots (A_i) \,|^{\mathrm{F}}\, V \,|^{\mathrm{N}}\, (A_{i+1}) \ldots (A_j) \,|^{\mathrm{F}'}\, (A_{j+1}) \ldots (A_n)]$

The question arises whether SRs in which the scope of negation splits a focus correspond to a traditional or at least intuitively recognizable type of negation. In order to find out, we shall start out examining the simplest variety. In FN-template (237) there is no focus stratification.

(237) $[(A_1) \ldots (A_i) \,|^{\mathrm{F}}\, V \,|^{\mathrm{N}}\, (A_{i+1}) \ldots (A_n)]$

In sentence (238) below, FN-template (237) yields SR (239).

(238) John did not drink WINE.

(239) $[(\text{John})_{ag} \,|^{\mathrm{F}}\, \text{drink.PST} \,|^{\mathrm{N}}\, (\text{wine})_{pat}]$

SR (239) seems to be acceptible for sequence (240). The verb constituent drink.PST belongs to the focus as it contributes to the answer to the question what John did, rather than the question what he drank. On the other hand, his drinking as such was never denied, so it is likely to end up in the complement.

(240) "They each had their own way of making ends meet and extending their miserable lives by doing so. Harry did not smoke cigars. *John did not drink wine.*"

Verb constituents that end up between the initial F- and N-boundaries tend to belong to a specific class, which includes verbs like *speak* and *eat*, as in sentences (241) and (242).

(241) John did not speak Russian.

(242) John did not eat meat.

Such verbs seem to hold an intermediate position between the scope of negation and the rest of the complement: in (241) and (242), *spoke* and *ate* do not

uniquely characterize the situation to be negated, since it is not denied that John spoke or ate. But their contribution to characterizing the non-negated parallel situations that are prompted by constituent negation (cf. 3.1) is negligible: everybody has the habit of speaking and eating. Crockett refers to verbs used in that way as *pragmatic presuppositions* and exempts them from the scope of negation dichotomy (Crockett 1977, 240–243).

The verbs that are used as pragmatic presuppositions do not necessarily make up a closed class. In propitious settings and contexts, any verb denoting an action that may turn into a habit is likely to be admitted as a pragmatic presupposition.

Pragmatic presuppositions may be construed in negative sentences with focus stratification. Consider sequence (243), which is a natural extension of sentence (238).

(243) "*John did not drink wine* because it made him feel insecure."

(244) [(John)$_{ag}$ |^{F} drink.PST |^{N} (wine)$_{pat}$ |$^{F'}$ (it made him feel insecure)$_{caus}$]

Admittedly, in our polysyncretic sentence (204), which fits FN-template (236), the verb *drink* is not easily construed as a pragmatic presupposition. Yet sequence (246) below may prompt SR (245).

(245) [(John)$_{ag}$ |^{F} drink.PST |^{N} (wine)$_{pat}$ |$^{F'}$ (his wife ordered Barolo)$_{caus}$]

(246) "The couple argued over everything. They adopted annoying habits just to tease the other. When she ostensibly squandered their money, he feigned austerity. While they dined out during the holidays, *John did not drink wine because his wife ordered Barolo*. While she worked her way through the expensive bottle, he sat there silently sipping his lager."

The question is whether SR (245) and SR (221) fit different inferential frames. At first sight, IF **A** applies to both SRs: John's drinking situation ***S*** does not exist, while his wife's ordering situation ***s*** does exist and causes the non-existence of John's drinking situation ***S***.

Yet the inferences are not identical for both SRs. The essence of the difference lies in the mode of existence of the situations. The distinction between expected and observed situations that was discussed in 11.1.2 applies here. While sequence (224), which prompts SR (221), is likely to trigger IF **A** for a specific situation, sequence (247) below may be an appropriate example of

triggering IF **A** for other situations than the specific one on which the speaker reports.

(247) "*John did not drink wine because his wife ordered Barolo*. But he made an exception at the funeral."

So while it is certain that Hajičová's method offers an effective tool for identifying and characterizing types of negation, the indications given in the present section on adding a sixth type to the five presented in section 14 are tentative. The relationship between pragmatic presuppositions and contextual boundness, and the prospects of integrating the former in FGD, require further investigation.

Also, it will be clear that it is not sufficient to describe inferences in terms of a limited inventory of logical categories, such as truth or existence. Before inferences can be used as a methodological tool for determining semantic representation, work must be done on enriching the repertory of categories of inference and on defining rules for using them that prevent that anything goes.

16 Discussion

What does it mean when there are five or six different semantic representations for a single sentence? Can a sentence have that many different meanings?

The large number of semantic representations for negative sentences is at least partly due to the tendency to assume one-to-one correspondence between the meanings of affirmative and negative sentences: for each distinction made in an affirmative sentence, a corresponding negative distinction is believed to exist. This requirement is generally met in logical metalanguages. But somehow natural language, or at least the neutral type of English that Hajičová uses, does not automatically reflect the distinctions that logic requires.

At the end of her paper, Hajičová suggests that logical analysis of negation does not necessarily work for linguistic negation.

> Our considerations about the possible placing of the scope of negation show that, for the description of negation in a natural language, the means used by the logicians are not the most suitable. (H91)

Inasfar as speakers have to resort to broad contexts to resolve the multiple homonymy of sentence (204), less logical approaches with less homonymy may be worth exploring.

As discussed in 9.1, Afrikaans *nie*$_2$ haplology presented a complication for its status as a "bracket marking the scope of negation", as Waher likes to view it (Waher 1978, 64–65). As we saw, the complication could be removed by replacing the representation of *nie*$_2$ in a logical metalanguage by a description of its actual role in speech events, which is instructing the hearer to discontinue *all* scopes of negation that are hanging in the air.

Similarly, the idea that negation should correspond to the logical "operator of negation" (H84) in the semantic representation might be revised.

Mathesius quotes Van Ginneken, who considered negation to be an emotional category, expressing a feeling of resistance (Mathesius 1937, 79; Van Ginneken 1907, 199vv.). Without going as far as that, a pragmatic, pre-logical analogy to the *nie*$_2$ solution might be worth exploring. Instead of imposing a logical meaning on the negation marker, we might simply regard the negation signal as an appeal to the hearer to select the *most appropriate* thought situation, given a setting and/or context, and to stratify it to the counterfactual third situation. In the sequences provided in sections 14 and 15, different appropriate thought situations to be negated happen to be selected for sentence (204) because the setting and the context prompt them. We might abstain from distinguishing those situations when analysing the meaning of the isolated sentence, and focus on what the negated sentence contributes to it, i.e. on the element that all types of negation have in common. This contribution is little more than the instruction to stratify *something* for negation. Possibly, negation is a rather "poor" category. For an analogy, consider deictic categories: the demonstratives *this* and *that* are instructions to the hearer to select appropriate referents in the setting or the context using certain properties that characterize them in the setting: their meanings are not permanent properties.

This suggestion aims to question the way of accounting for the results of Hajičová's exercise, rather than questioning their value. After identifying the "poor" meaning of the negative signal, the problem of applying it in various circumstances returns, and will require investigating linguistic usage, by distinguishing various types of negation, both on an empirical basis and by deductive methods. So the value of discovering and distinguishing types of negation, whether you call them *meanings*, *variants* or *clusters of inferences*, is beyond dispute.

17 Loose Ends

The present exercise leaves us with loose ends of various degrees of importance. It is not unlikely that they have been dealt with in more recent work of the Prague tradition. It may nonetheless be useful to mention some issues here, as suggestions for further epistemological work on functional generative description.

As a minor issue, a way must be found to account for constituent negation in cases where the verb constituent is either the only negated constituent, or the only constituent in the complement (cf. 10.2). This seems to be a matter of devising amendments. The same is likely to apply to external negation (cf. 7.1).

The problem of the focus boundary splitting constituents in the case of non-projective sentences, as discussed in 6.4, promises to be more serious. It is a consequence of the architecture of the model, more specifically the format of Sgall's tectogrammatical level, in which the communicative dynamism hierachy of a sentence and its syntactic dependency structure jointly determine the semantic representation of a sentence and are mapped onto each other in a straightforward manner. The present writer is not yet aware of any literature on the functional generative description framework that deals with the problem of non-projective structures shirking this format.

The empirical basis for the analysis is another issue. Thus far, semantic representations are treated as more or less universal constructs, which are relatively immune to cross-linguistic and intra-linguistic variation. Matters become more complex after acknowledging that both functional sentence perspective and negation may vary between languages, not only in their ways of expressing them but also in the choices made as to what distinctions to express. Speakers of different languages have different devices available to navigate their hearers' attention between the situations and objects they conjure up. For instance, as Crockett observes, negative sentences are less ambiguous in Russian than in English (Crockett 1977, 230). Whether English can afford tolerating ambiguity on the level of situations by offering more means to navigate hearers among objects and concepts in exchange (viz. through the category of definiteness) is an issue that deserves a closer look (cf. 2.3). Also, diversity within a language has not yet been taken into account. Empirical observation has so far been limited to the neutral styles: ways of navigating hearers by means of extraction (esp. in English) and prosodic patterns have been excluded. As shown in Keijsper 1985, functional sentence perspective thrives on prosody.

Finally, as mentioned in section 15, the methodological status of inferences, or rather interpretation, requires further elucidation. It would be futile, how-

ever, to comment on the concept in passing, without involving Hajičová's numerous ulterior publications (e.g. Hajičová 1974 and Hajičová 1984).

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References

Adamec, Pržemysl. 1966. *Porjadok slov v sovremennom russkom jazyke* (= *Rozpravy Československé akademie věd: Řada společenskýx věd* 76/15). Praha: Academia.

Apresjan, Jurij Derenikovič. 1966. *Idei i metody sovremennoj strukturnoj lingvistiki: kratkij očerk*. Moskva: Prosveščenie.

Bach, Emmon. 1968. "Nouns and Noun Phrases." In *Universals in Linguistic Theory*, edited by Emmon Bach and Robert T. Harms, 90–122 (references 205–210). London–New York–Sydney–Toronto: Holt, Rinehart and Winston.

Bühler, Karl. 1918. "Kritische Musterung der neuen Theorien des Satzes." In *Indogermanisches Jahrbuch* 6:1–20.

Bühler, Karl. 1922. "Vom Wesen der Syntax." In *Idealistische Neuphilologie: Festschrift für Karl Vossler zum 6. September 1922*, edited by Victor Klemperer and Eugen Lerch. (= *Sammlung romanischer Elementar- und Handbücher; V. Reihe: Untersuchungen und Texte*), 54–84. Heidelberg: Carl Winter's Universitätsbuchhandlung.

Bühler, Karl. 1934. *Sprachtheorie: Die Darstellungsfunktion der Sprache*. Jena: Gustav Fischer.

Chomsky, Noam. 1957. *Syntactic Structures* (= *Janua linguarum, Series minor* 4). The Hague–Paris: Mouton.

Chomsky, Noam. 1971[2] (1970). "Deep Structure, Surface Structure, and Semantic Interpretation." In *Semantics: An Interdisciplinary Reader in Philosophy, Linguistics and Psychology*, edited by Danny D. Steinberg and Leon A. Jakobovits, 183–216. Cambridge University Press. Originally published in Roman Jakobson and Shigeo Kawamoto, eds., *Studies in General and Oriental Linguistics Presented to Shirô Hattori on the Occasion of his Sixtieth Birthday* (Tokyo: TEC Corporation for Language and Educational Research, 1970).

Cooper, David E. 1974. *Presupposition* (= *Janua linguarum, Series minor* 203). The Hague–Paris: Mouton.

Crockett, Dina B. 1977. "The Scope of Denial in Russian Negative Sentences." *Lingua* 43:229–245.

Ebeling, Carl L. 1978. *Syntax and Semantics: A Taxonomic Approach*. Leiden: E.J. Brill.

Ebeling, Carl L. 1994. *Een inleiding tot de syntaxis*. Leiden: The Hakuchi Press.

Fillmore, Charles J. 1968. "The Case for Case." In *Universals in Linguistic Theory*, edited by Emmon Bach and Robert T. Harms, xii–88 (references 205–210). London–New

York–Sydney–Toronto: Holt, Rinehart and Winston.

Firbas, Jan. 1964. "On Defining the Theme in Functional Sentence Analysis." In *Travaux linguistiques de Prague 1: L'école de Prague d'aujourd'hui*, edited by F. Daneš, K. Horálek, V. Skalička, P. Trost and J. Vachek, 267–280. Prague: Éditions de l'Académie tchécoslovaque des sciences.

Hadžiselimović, Omer, and Zvonimir Radeljković. 2007. "Literature is what you should re-read: An Interview with Susan Sontag." *Spirit of Bosnia* 2/2. www.spiritofbosnia.org/volume-2-no-2-2007-april/literature-is-what-you-should-re-read-an-interview-with-susan-sontag/.

Hajičová, Eva. 1973. "Negation and Topic vs. Comment." *Philologica Pragensia* 16:81–93.

Hajičová, Eva. 1974. "Meaning, Presupposition, and Allegation." *Philologica Pragensia* 17:18–25.

Hajičová, Eva. 1975. *Negace a presupozice ve významové stavbě věty* (*Studie a práce lingvistiké* 11). Praha: Academia.

Hajičová, Eva. 1984. "On Presupposition and Allegation." In *Contributions to Functional Syntax, Semantics and Language Comprehension*, edited by Petr Sgall. (= *Linguistic and Literary Studies in Eastern Europe* 16), 99–122. Amsterdam–Philadelphia: John Benjamins Publishing Company.

Hajičová, Eva. 2013. "Contextual Boundness and Discourse Patterns Revisited." *Discourse Studies* 15:535–550.

Hays, David G. 1964. "Dependency Theory: A Formalism and Some Observations." *Language* 40:511–525.

Heynick, Frank. 1985. *Some Preliminary Notes on the Discontinuous Negative in Afrikaans Syntax and How it May Interact with Short-term Memory Factors in the Linguistic Production of Normals and Schizophrenics*. Eindhoven: Eindhoven University of Technology (internal working paper).

Ihm, Peter, and Yves Lecerf. 1963. *Éléments pour une grammaire générale des langues projectives. Rapport CETIS* 8/1. Ispra: Euratom-CETIS.

Jackendoff, Ray S. 1969. "An Interpretive Theory of Negation." *Foundations of Language* 5:218–241.

Katz, Jerrold J., and Paul M. Postal. 1964. *An Integrated Theory of Linguistic Descriptions. Research Monograph* 26. Cambridge (Mass.): The M.I.T. Press.

Keijsper, Cornelia E. 1985. *Information Structure: With Examples from Russian, English and Dutch*. (= *Studies in Slavic and General Linguistics* 4). Amsterdam: Rodopi.

Kern, Franz. 1884. *Grundriß der deutschen Satzlehre*. Berlin: Nicolaische Verlags-Buchhandlung.

Klima, Edward S. 1964. "Negation in English." In *The Structure of Language: Readings in the Philosophy of Language*, edited by Jerry A. Fodor and Jerrold J. Katz, 246–323. Englewood Cliffs (N.J.): Prentice-Hall.

Kovtunova, Irina Il'inična. 1967. "Principy slovoraspoloženija v sovremennom russkom jazyke." In *Russkij jazyk: grammatičeskie issledovanija*, edited by N.Ju. Švedova, 96–146. Moskva: Nauka.

Lakoff, George. 1971². "On Generative Semantics." In *Semantics: An Interdiscplinary Reader in Philosophy, Linguistics and Psychology*, edited by Danny D. Steinberg and Leon A. Jakobovits, 232–296. Cambridge University Press.

Mathesius, Vilém. 1937. "Double Negation and Grammatical Concord." In *Mélanges de linguistique et de philologie offerts à Jacq. van Ginneken à l'occasion du soixantième anniversaire de sa naissance*, 79–83. Paris: Librairie C. Klincksieck.

McCawley, James D. 1976² (1970). "On the Deep Structure of Negative Clauses". *Grammar and Meaning: Papers on Syntactic and Semantic Topics*, 277–284. New York–San Francisco–London: Academic Press. Originally published in *Eigo Kyōiku* 19/6:72–75.

Mel'čuk, Igor' Aleksandrovič. 1974. *Opyt teorii lingvističeskix modelej "smysl ⇔ tekst": semantika, sintaksis*. Moskva: Nauka: Glavnaja redakcija vostočnoj literatury.

Padučeva, Elena Viktorovna. 1964. "O sposobax predstavlenija sintaksičeskoj struktury predloženija." *Voprosy jazykoznanija* 13/2:99–113.

Padučeva, Elena Viktorovna. 2006. "Genitiv dopolnenija v otricatel'nom predloženii." *Voprosy jazykoznanija* 55/6:21–43.

Panenová, Jarmila, and Petr Sgall. 1995. "Although her Life with us has not been Easy …." In *Discourse and Meaning: Papers in Honor of Eva Hajičová*, edited by Barbara H. Partee and Petr Sgall, 3–13. Amsterdam–Philadelphia: John Benjamins Publishing Company.

Partee, Barbara Hall. 1971. "On the Requirement that Transformations Preserve Meanings." In *Studies in Linguistic Semantics*, edited by Charles J. Fillmore and D. Terence Langendoen, x–21 (references 291–296). New York–Chicago–San Francisco–Atlanta–Dallas–Montreal–Toronto–London–Sydney: Holt, Rinehart and Winston.

Peškovskij, Aleksandr Matveevič. 1928³. *Russkij sintaksis v naučnom osveščenii*. Moskva–Leningrad: Gosudarstvennoe izdatel'stvo.

Reichenbach, Hans. 1947. *Elements of Symbolic Logic.* New York: The MacMillan Company.

Russell, Bertrand. 1948. *Human Knowledge: Its Scope and Limits*. London: George Allen and Unwin Ltd.

Sgall, Petr, Eva Hajičová and Eva Benešová. 1973. *Topic, Focus and Generative Semantics.* (= *Forschungen Linguistik und Kommunikationswissenschaft* 1). Kronberg (Taunus): Scriptor Verlag GmbH.

Šmilauer, Vladimír. 1947. *Novočeská skladba: první část nové mluvnice moderního českého jazyka*. (= *Knižnice Kruhu přátel českého jazyk* 5). Praha: Ing. Mikuta.

Šmilauer, Vladimír. 1966². *Novočeská skladba*. Praha: Státní Pedagogické Nakladatelství.

Tesnière, Lucien. 1966². *Éléments de syntaxe structurale*. Paris: Klincksieck.

Tiktin, Hariton. 1893. *Gramatica romînă, Partea 2: sintaxa*. Iași: Ed. Librăriei Scoalelor Fratiĭ Saraga.

van Ginneken, Jacques. 1907. *Principes de linguistique psychologique: essai de synthèse*. (= *Bibliothèque de philosophie expérimentale* 4). Paris–Leipzig–Amsterdam: Marcel Rivière–Otto Harrassowitz–E. van der Vecht.

Waher, Hester. 1978. *Die probleem van die bereik van die ontkenning met spesiale verwysing na Afrikaans*. Kaapstad: Universiteit van Kaapstad (PhD thesis).