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Salience in Dialogues

1. Introduction

The communicative situation of a dialogue is characterized by involving at least two participants, who take turns in producing utterances concerning some entities and relations among them. In a coherent dialogue, different utterances concern the same or related entities. Attention concentrates on some entities and relations among them, and then moves on to others, sometimes returning back again, as the discourse proceeds.

It belongs to the tasks of discourse processing to determine what entities are being referred to at any given point. In discourse production, one needs to plan what to refer to and when. In discourse understanding, one needs to resolve references. Therefore, it appears important to be able to track the changes of attention throughout a discourse, so that the information about salience of the entities referred to in the discourse can be employed for generation or analysis of utterances.

One of the attempts to account for the relations between the changes of attention in discourse and the choices of referring expressions has been formulated on the basis of the Functional Generative Description framework developed by Prague School linguists (cf. Sgall et al. 1986, Hajičová 1993). We refer to it as the TFA-based approach because it relies on the topic-focus articulation (TFA) of sentences uttered in discourse.[1] It relates reference to entities in either topic or focus to the degrees of activation (salience) of these entities in the stock of shared knowledge, i.e., a domain the speaker assumes to be shared by the hearer. The degree of activation of an entity once referred to in a discourse changes as the discourse unfolds, depending on whether the entity is referred to subsequently, and if so, whether it is referred to in the topic or in the focus.

The TFA-based approach has been developed for the analysis of discourses of the monologue type. Therefore, we have decided to investigate whether it can be applied to the analysis of dialogues. The aim of our present paper is to point out some aspects in which the TFA-based approach should be complemented to handle dialogues.

This paper has the following organization. In Sections 2 and 3 we summarize the basic notions of the functional generative framework, and the principles of the TFA-based approach to modelling salience in monologues, respectively. Section 4 overviews some characteristics of the dialogue which require a modification of the TFA-based approach. Subsequently, we introduce the modified version of the TFA-based approach in Sections 5 and 6. Section 7 comprises our final remarks and suggestions for future research.

2. The initial framework

We work within the Praguian framework of Functional Generative Description (FGD) (cf. Sgall 1967, Sgall et al. 1986). FGD works with several levels of representation of the sentence, ranging from the phonemic (graphemic) level which represents the external shape of a sentence, to the tectogrammatic level which represents its linguistic meaning. The representation of a sentence at the tectogrammatic level (TR) consists of nodes, corresponding to semantemes, carrying complex labels encoding various kinds of information. The TR has three further ingredients: the structural relations between semantemes (reflecting their dependency and coordination relationships), the scale of communicative dynamism (reflecting „deep word order“) and the distinction between contextual boundness and non-boundness for each semanteme (reflecting its position in the linguistic patterning of the opposition between „given“ and „new“[2]).

It is considered one of the fundamental aspects of the sentence structure in the FGD framework that by uttering the sentence, the speaker attempts on the basis of the rules of the given language to cause the hearer to modify his state of memory.[3] For this purpose, the speaker produces utterances articulated into two parts, a topic and a focus. The topic identifies the entities that should be modified, and the focus identifies the modifications. The hearer interprets the speaker's utterances likewise. The topic-focus articulation (TFA) of a sentence is defined on the basis of the primitive notion of contextual boundness as follows (see Sgall et al. 1986):

The *focus of a sentence* contains all contextually non-bound nodes depending directly on the verb together with all nodes subordinate to them (i.e., depending on it indirectly), be they contextually bound or non-bound; the verb itself is contained in the focus if it is non-bound. Whenever the verb as well as all nodes directly dependent on it are contextually bound, the focus is defined likewise with respect to a deeper embedded node. *The topic of a sentence* consists of those nodes that are not contained in the focus.

In order for any communication between a speaker and a hearer to be possible, they need to have a „common ground“ which provides, e.g., a basis for identifying referents. Within the FGD framework, the term *stock of shared knowledge* (SSK) has been introduced to refer to the „common ground“ that the speaker assumes to be in the hearer's mind. The SSK has a dynamic character. As a discourse progresses and attention moves from some entities to others, the set of entities and relations among them included in the SSK changes. The entities in the SSK are assigned different *degrees of activation*, i.e., some of them are more activated (salient) than others, and therefore easier to access for the interlocutors. The changes in attention as the discourse progresses are reflected by changes in the activation degrees of entities in the SSK. The changes in the degree of activation depend on whether the entity is being referred to subsequently, and if so, by what form of expression, and whether it is rendered as contextually bound or non-bound, in the topic or in the focus. Associative links through which an entity can be accessed indirectly and thus activated implicitly are also taken into account.

In the TFA-based approach, one of the main characteristics of a smooth discourse is that the speaker chooses only those entities to be rendered by contextually bound expressions which she supposes to have a high degree of activation in the SSK, because then the hearer should be able to identify the referents easily. Entities with a low degree of activation can only be referred to by contextually non-bound expressions. Concentrating on the verb and the lexical items directly dependent on it in the TR of a sentence (leaving thus aside embedded lexical items), one can say that non-activated entities can be referred to only in the focus-part of the sentence, while activated entities can be referred to in the topic- as well as in the focus-part of the sentence.

The hierarchy of activation is used as one of the clues for resolution of anaphoric reference during discourse interpretation and, in the case of production, for selection of appropriate forms of referring expressions.

3. Modelling salience in monologues

The TFA-based approach to modelling salience in monologues was presented first in (Hajičová/Vrbová 1981) and (Hajičová/Vrbová 1982), and further developed in (Hajičová 1987; Hajičová 1993) and (Hajičová et al. 1995). In order to represent salience, it specifies assignments of activation degrees to entities in the SSK in relation to the position of the expression referring to them in the topic or focus of the sentence and to the form of these expressions.

It has been proposed to represent the degrees of activation of entities in the SSK tentatively by natural numbers assigned to these entities in such a way that the most activated entities obtain the smallest number and the lower the activation of an entity the greater is the number assigned to it.[4] Denoting a linguistic expression x referring to an entity a by x_a, and an entity a with degree of activation n by a^n, the following rules for transitions (denoted by $a^n \rightarrow a^m$) in degree of activation triggered by utterance U_i can be formulated (similarly as in Hajičová 1993):[5]

Activation assignments:

1. if a^n is referred to within the focus-part of U_i, then $a^n \rightarrow a^0$
2. if a^n is referred to by a weak (unstressed) anaphoric pronoun or a zero-pronoun within the topic-part of $U_{i,}$, then $a^n \rightarrow a^n$
3. if a^n is referred to by a definite noun phrase within the topic-part of U_i, then $a^n \rightarrow a^1$

4. if an entity a^n is neither referred to nor included among the entities associated with some entity that is referred to in U_i, then $a^n \rightarrow a^{n+2}$ for a^n that has only been referred to in the focus of a preceding utterance, and $a^n \rightarrow a^{n+1}$ for an entity that has been referred to in the topic of a preceding utterance
5. if $a^n \rightarrow a^m$ then $b^r \rightarrow b^{m+2}$ for all entities b associated with a and not referred to in U_i

The degrees of activation impose a partial ordering on entities in the stock of shared knowledge; there can be entities having the same degree of activation, which is represented by assigning them the same number.

4. Some characteristics of dialogues

In this Section we discuss some phenomena encountered in dialogues. As a basis for our discussion, we have examined a number of dialogues originating from various sources, among which were transcriptions from recordings of dialogues in Czech originally included as dialogues „in front of the curtain“ in the plays of Jiří Voskovec and Jan Werich in the „Osvobozené divadlo“ (Liberated Theatre), transcriptions of English dialogues from (Svartvik/Quirk 1980), as well as transcriptions of dialogues from our own every-day communication, which we noted because of some kind of anomaly.

Applying the notion of stock of shared knowledge characterized in the preceding section to these dialogues, we have come across certain phenomena partly typical of dialogues, which have not yet been covered by the postulation of a uniform SSK and by the tentative heuristics of activation assignment. The interesting issues we have encountered belong to several different aspects of analysis:[6]

(i) What is referred to in the dialogue (question of the state of the stock of shared knowledge):
- participants themselves or groups in which they are included (cf. esp. dialogues II and III)
- other entities from the situational context (cf. „the tram stop“ in I/4, or „this“ in III/4 referring to the banging of the radiator)

(ii) How are the entities referred to (question of their referential status in the utterance):
- since different utterances in a dialogue can be directed to different hearers, the participants who at one point were addressed by second person pronouns can be referred to by third person pronouns at another point, and vice versa (cf. dialogue II)
- the entities can be referred to from a different perspective by the same speaker (cf. dialogue IV, where the referent of „he“ and „I“ is the same, but the speaker changes the perspective)
- a speaker may refer to an entity as if it were already familiar, even though it has not yet been introduced (cf. „the building“ in III/7, „these people“ in IV/8, or dialogue I which evolves around resolving a reference to an unfamiliar entity by a pronoun)

(iii) Discrepancies among participants (question of differences in their knowledge and/or attention):
- an entity can have a high salience for one participant and a low one for another (cf. dialogue I)
- a participant can lack some information that another one has, or the participants may have conflicting pieces of information (cf. II/2-3 and II/4, which present contrary responses to a question)

(iv) Turn taking (question of attention changes across speakers’ turns):
- next speaker can change attention or leave it the same (esp. elliptical responses)
- next speaker can „ignore“ intervening utterances of other speaker(s)

- next speaker can „recycle“ entities referred to in preceding utterance(s)

In order to be applicable to dialogue analysis, the TFA-based approach needs to be complemented in the above mentioned respects. The next section comprises our first attempt to formulate such modifications.

5. Framework modification

We assume that before the initiation of a dialogue, each participant is in a certain „cognitive state“, which contains the participant's own beliefs and intentions pertaining to entities and relations among them, as well as his/her beliefs about beliefs and intentions of other participant(s).[7] Obviously, a dialogue does not concern all the entities in the participants' cognitive states, not even all those that are salient. Moreover, the cognitive states of the individual participants usually differ. An important portion of a dialogue seems to be devoted to the participants' efforts to find out in what respects their cognitive states diverge and their attempts to change one another's cognitive state so that they (become to) converge on the matter at hand.

Thus, it is suitable to introduce the relativized notion of *individual stock of dialogue knowledge* (ISDK) to refer to the portion of an individual participant's cognitive state which s/he considers relevant (and therefore activated) during the dialogue. The ISDK of a participant reflects his/her own attention changes which are only partly influenced by the contents of the dialogue. A participant may, for instance, preserve high activation of an entity in spite of the fact that it has not been referred to in a long stretch of the dialogue.

For the sake of any communication to be possible, the participants assume that their ISDK's have something in common at every point during their communication, notably also at its beginning. This „common ground“ arises from the participants' individual cognitive states which also include the recollections from their previous encounters, the reflections of their current situational context(s), and so on.[8] In the sequel, we use the notion of *shared stock of dialogue knowledge* (SSDK) to represent this common ground. Essentially, the SSDK is the structure where the dialogue participants converge on the entities and relations between them concerned in the dialogue, and their activation, i.e., the participants have established mutual assent on something with respect to the dialogue itself.[9]

The distinction between the SSDK and the ISDKs makes it possible to distinguish, e.g., between the mutually established beliefs involved in the dialogue itself (reflected in the SSDK) and the beliefs of individual participants (comprised in each participant's ISDK). Although the participants of a dialogue establish a „common ground“, this does not mean that any of them actually changes his/her „mind“ about anything.

In a coherent dialogue, the contextually bound expressions refer to entities activated above a certain threshold in the SSDK. This is one of the main characteristics of a finite mechanism enabling the interlocutors to determine the reference of anaphoric expressions. The deictically referring contextually bound expressions, on the other hand, are assumed by the speaker to be obvious enough for the hearer to resolve their reference (in some cases without success, cf. dialogue I). The reference of deictic non-bound expressions is determined on the basis of the „guidelines" included in the sentence itself.

6. Modelling salience in dialogues

We are now working with two kinds of dialogue knowledge stocks: The ISDKs pertain to particular dialogue participants. An ISDK is conceived of as a sub-structure of an individual dialogue participant's cognitive state and as containing entities and relations between them activated above a certain threshold. The activation degrees of entities in the ISDK depend on the participant's own attention, dialogue intentions, etc. It is therefore possible that an entity has a high activation degree in one participant's ISDK and a low one in another's. In this way we can account for the differences between dialogue participants. The SSDK is conceived of as a structure containing those entities and relations between them which are present in all the participants' ISDKs. Their activation degrees are considered to be mutually established.

Since it would be unrealistic to assume that every participant perceives the same entities in the situational context, we suggest to consider their representations to belong to the ISDKs, and their activation degree to depend on whether attention of the participant is concentrated on them or not (unless, of course, they get explicitly referred to in the dialogue). As for the dialogue participants themselves, we conjecture that the corresponding entities have a special status, and that they become part of the SSDK implicitly and remain activated to a certain degree without explicit reference in the dialogue (see rule 6 introduced below).

An entity once referred to in the dialogue may have high or low activation degree in the SSDK depending on its status within the dialogue, and possibly independently of its previous activation in the ISDK's of particular participants. As in the original TFA-based approach, the degrees of activation in the SSDK are assigned with respect to whether an entity is referred to in the topic or in the focus of an utterance, by a contextually bound or non-bound expression, rendered by a pronominalized or full noun phrase.

Regarding activation degree assignments in the SSDK, we treat a dialogue as a sequence of utterances, and assign the degrees of activation according to the TFA patterning one after another.

We have encountered one occurrence of an anaphoric, even pronominal, reference, where an entity last referred to by some participant, C, in utterance U_{n-i} and not referred to by other participants in utterances U_{n-i+1} through U_{n-1} is the referent of an anaphoric pronoun in U_n uttered by C, while there is a competing antecedent for the pronoun in the intermediate utterances (see II/18). This could mean that the speaker of an utterance regards the entities she has referred to as more salient than any entity referred to in the temporally preceding utterances. It is an open question whether such considerations are mutual among the dialogue participants and should therefore be reflected also in the SSDK. In any case, they need to be reflected by differences between the ISDKs of the individual participants.[10] Before a framework handling these intricacies can be established, it will be necessary to analyze a much larger amount of relevant empirical data. For the time being, our approach to determining anaphoric reference takes into account the relative degrees of activation in the SSDK, irrespective of whether the potential antecedent expression was uttered by the same speaker who utters the anaphor or not.

With respect to elliptical responses, like „yes“, „no“, „surely“ or „not yet“, which have little contents of their own on the basis of which attention could change, we assume that they preserve the activation of those entities the reference to which is elided (see rule 2 in Section 3).

Having accepted these assumptions and having introduced the notions of ISDK and SSDK enables us to adopt the rules of activation assignment as proposed for monologue also for the assignment of activation degrees in the SSDK in dialogue analysis. We add the following rule accounting for the constant activation of the entities corresponding to the dialogue participants (their activation when explicitly referred to follows the original rules 1 and 2):

6. for every dialogue participant x not referred to in utterance U_i, there is an entity x^1 present in the SSDK

The results of applying rules 1 through 6 to dialogue analysis in the form of tracking activation degrees of entities in the SSDK are shown in the Appendix.

The ease with which the hearer can identify the referents of contextually bound expressions can be used as a measure of felicity of the given utterance with respect to the given context, including the given pair of speaker and hearer, in a smooth discourse. The entities which the speaker cannot assume to be accessible for the hearer, are referred to by contextually non-bound expressions. Even in this case a fully competent speaker chooses the referring expressions in such a way as to minimize the effort she expects the hearer will need to identify the referents.

7. Concluding remarks

In the present paper, we have presented the results of our investigation of whether the TFA-based approach to salience modelling can be applied to the analysis of dialogues. The assignment of activation degrees as proposed originally for the treatment of monologue can also be employed for analyzing dialogue, with one addition concerning the activation of the dialogue participants.

It also appears that for the sake of dialogue analysis, it is helpful to introduce two kinds of stock of dialogue knowledge, individual and shared, which make it possible to account for some of the dialogue phenomena.

The results we presented in this paper establish a ground for further research on dialogues within the Praguian framework. Detailed studies of activation assignment triggered by reference to various kinds of abstract entities (events, propositions, properties and so on), by complex utterances, or by utterances with particular types of modalities, as well as the relation between discourse structure and activation belong to the interesting issues to be addressed in the future.

Appendix: Examples

We present four dialogues to demonstrate the dialogue phenomena referred to in the main body of the paper. Dialogue I is a real-life example including an anomaly due to the speaker's wrong assumption about the activation degree of the entity referred to by „he" according to the hearer. Dialogues II, III and IV, are all extracts from Svartvik/Quirk (1980). In the original orthographic transcription the basic prosodic distinctions (tone units, nuclei, boosters, onsets and stresses) were retained; for our purposes, we mark by CAPITALS only the word carrying what the authors call the nuclear tone (in most cases we would call it intonation centre of the utterance). Angled brackets <> embrace „incomprehensible words" (sometimes it was only possible to tell the number of syllables, in which case we leave the space between the brackets empty). We number the utterances, prototypically one sentence or clause. We denote the entities referred to by subscripts inserted into the input utterances. The unordered list after each utterance depicts the state of the stock of shared dialogue knowledge (SSDK) after processing that utterance. Its elements are the entities referred to with their degrees of activation indicated by superscripts. For the sake of the current discussion we do not take into account associative links among elements in the SSK (i.e., we omit activation assignment rules 4 and 5) when determining the activation degrees.

Dialogue I

A:		(at a tram stop, getting into a tram together with B)	
	1	He$_m$ is my$_A$ RELATIVE.	$\{m^1, A^1, B^1\}$
B:		(puzzled)	
	2	WHOM$_m$?	$\{m^0, A^1, B^1\}$
A:	3	The MAN$_m$.	$\{m^0, A^1, B^1\}$
B:		(???)	
A:	4	At the TRAM stop$_s$.	$\{m^0, s^0, A^1, B^1\}$
B:	5	WHICH man$_m$?	$\{m^0, s^2, A^1, B^1\}$
A:	6	Oh, the man$_m$ with the PONY TAIL$_t$.	$\{t^0, m^1, s^4, A^1, B^1\}$
	7	Have you$_B$ NOTICED him$_m$?	$\{m^1, t^2, s^6, A^1, B^1\}$
B:	8	Aha, THAT man$_m$.	$\{m^0, t^4, s^8, A^1, B^1\}$
A:	9	You see, you$_B$ SAW him$_m$.	$\{m^0, t^6, s^{10}, A^1, B^1\}$
	10	Maybe he$_m$ was my$_A$ RELATIVE.	$\{m^0, t^8, s^{12}, A^1, B^1\}$

The man with the pony tail was the only man A noticed and wrongly assumed that B's attention would also concentrate on him. Although B noticed the man too, he did not concentrate solely on him. That is why the misunderstanding occurred, because B couldn't single out a unique referent of „he" in A's first utterance.

Dialogue II

A:	1	Is this a thing$_t$ which you$_{B+C}$'ve raised on your$_{B+C}$ staff STUDENT committee$_{co}$?	$\{co^0, t^1, A^1, B^1, C^1\}$
B:	2	Not YET,	$\{co^0, t^1, A^1, B^1, C^1\}$
	3	NO.	$\{co^0, t^1, A^1, B^1, C^1\}$
C:	4	It$_t$ HAS been raised in the staff student committee$_{co}$ actually,	$\{co^1, t^1, A^1, B^1, C^1\}$
	5	YES.	$\{co^1, t^1, A^1, B^1, C^1\}$
A:	6	Is this <the thing are> are you$_{B+C}$ MEMBERS$_{ms}$ of the staff student committee$_{co}$?	$\{ms^0, co^1, t^2, A^1, B^1, C^1\}$
C:	7	Well, I$_C$ am and	$\{ms^0, co^1, t^3, A^1, B^1, C^0\}$
	8	HE$_B$ is,	$\{ms^0, co^1, t^4, A^1, B^0, C^1\}$
	9	YES,	$\{ms^0, co^1, t^5, A^1, B^0, C^1\}$
	10	we$_{B+C}$ ARE.	$\{ms^0, co^1, t^6, A^1, B^0, C^0\}$

B:		<>	
A:	11	YEAH.	$\{ms^0, co^1, t^7, A^1, B^0, C^0\}$
	12	Does it$_{co}$ WORK?	$\{ms^2, co^1, t^8, A^1, B^1, C^1\}$
	13	Does it$_{co}$ does is get ACTION$_a$?	$\{a^0, ms^4, co^1, t^9, A^1, B^1, C^1\}$
B:	14	Well, I$_B$ I$_B$ I$_B$ mean I$_B$'ve only just been ELECTED.	$\{a^2, ms^4, co^1, t^{10}, A^1, B^1, C^1\}$
	15	I$_B$ haven't yet been to a MEETING$_e$.	$\{e^0, a^4, ms^6, co^1, t^{11}, A^1, B^1, C^1\}$
A:		<Oh no haven't you$_B$>	
	16	YEAH.	$\{e^0, a^6, ms^8, co^1, t^{12}, A^1, B^1, C^1\}$
C:		Well,	
	17	I$_C$'m a THIRD year rep$_r$ and	$\{r^0, e^2, a^8, ms^{10}, co^2, t^{13}, A^1,B^1,C^1\}$
	18	it$_t$ HAS been raised SEVERAL times in the meetings$_e$ …	$\{r^2, e^1, a^{10}, ms^{12}, co^2, t^1, A^1,B^1,C^1\}$

Note that the entity „the thing" referred to by „it" uttered by participant C in 4 and not referred to by any participant in 5 through 17 is referred to by the weak anaphoric pronoun „it" again in 18 uttered by participant C, although two other competing highly activated entities are present, namely those of „committee" and „meeting", with activation degrees 1 and 2, respectively. For a scheme of the activation degree changes see Figure 1.

Dialogue III

C:	1	I$_C$ think they$_t$'re TRYING to do as much as they$_t$ can	$\{t^1, A^1, B^1, C^1\}$
	2	once we$_w$ say what we$_w$ NEED.	$\{w^1, t^2, A^1, B^1, C^1\}$
	3	SURELY	$\{w^1, t^3, A^1, B^1, C^1\}$
		(radiator bangs)	
A:	4	Is this$_{th}$ the NORMAL thing$_{th}$ which goes on with the radiator$_r$?	$\{th^1, r^1, w^2, t^4, A^1, B^1, C^1\}$
C:	5	<m> YES.	$\{th^1, r^1, w^3, t^5, A^1, B^1, C^1\}$
	6	YES.	$\{th^1, r^1, w^4, t^6, A^1, B^1, C^1\}$
VAR		<laugh>	
A:	7	all over the BUILDING$_b$ do you$_C$ mean?	$\{b^0, th^1, r^2, w^5, t^7, A^1, B^1, C^1\}$
VAR	8	YES.	$\{b^0, th^1, r^3, w^6, t^8, A^1, B^1, C^1\}$

For a scheme of the activation degree changes see Figure 2

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1. 7.

2. 8.

3. 9.

4. 10.

5. 11.

6. 12.

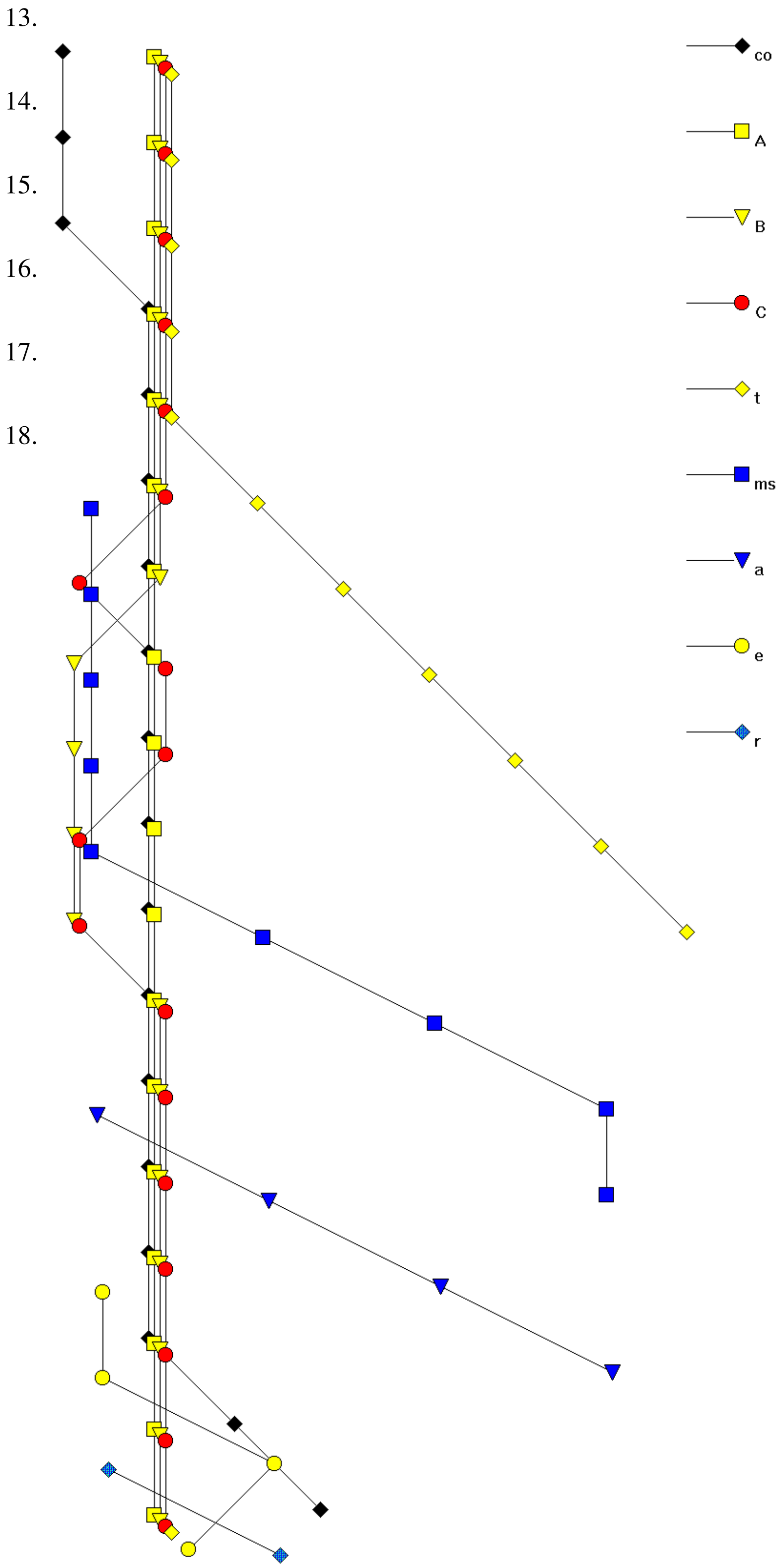

Figure 1:[11] *Schematic illustration of the changes in activation degrees in Dialogue II.*

The markers of the entities are the same as in the text of dialogue II. The highest degree of activation (0) is depicted at the left hand side, the lower degrees (1 to 8) successively to the right of it. Degress lower than 8 are not included in the picture. Each line corresponds to the state of activation in the SSK after processing of the respective utterance, i.e., the n-th line represents the state after the utterance of the n-th sentence in the dialogue.

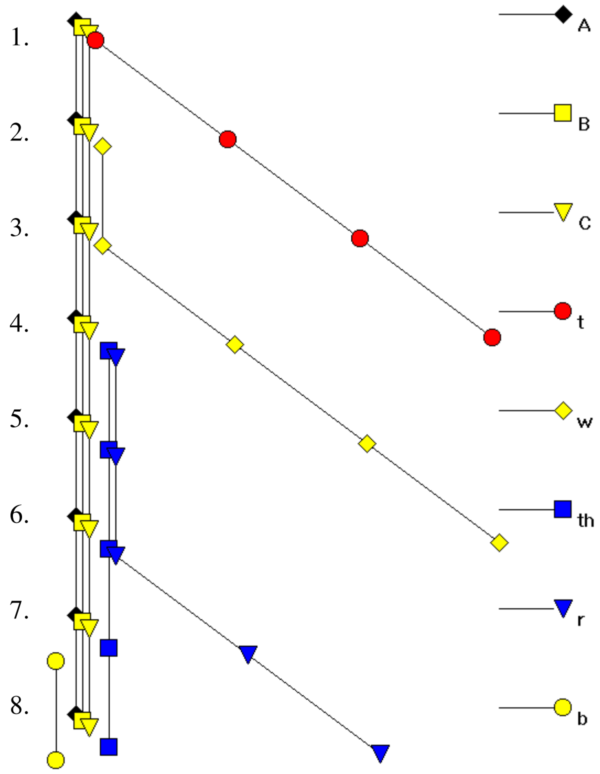

Figure 2: Schematic illustration of the changes in activation degrees in Dialogue III.

The markers of the entitities are the same as in the text of dialogue III. The highest degree of activation (0) is depicted at the left hand side, the lower degrees (1 to 8) successively to the right of it. Degress lower than 8 are not included in the picture. Each line corresponds to the state of activation in the SSK after processing of the respective utterance, i.e., the n-th line represents the state after the utterance of the n-th sentence in the dialogue.

Dialogue IV

B:	1	which$_i$ he$_h$ ADMITTED it$_i$ was	$\{i^1, h^1, A^1, B^1\}$
A:	2	YES, OF COURSE	$\{i^1, h^1, A^1, B^1\}$
B:	3	EXACTLY what$_i$ he$_h$ has done.	$\{i^1, h^1, A^1, B^1\}$
	4	He$_h$ hadn't had any SINCERETY in his$_h$ writing$_w$ at ALL	$\{w^1, i^2, h^1, A^1, B^1\}$
A:	5	NO.	$\{w^1, i^3, h^1, A^1, B^1\}$
B:	6	He$_h$'d just played his$_h$ CARDS$_C$ CAREFULLY.	$\{c^0, w^2, i^4, h^1, A^1, B^1\}$
A:	7	YES.	$\{c^0, w^3, i^5, h^1, A^1, B^1\}$
B:	8	How can I$_h$ PLEASE these people$_p$.	$\{p^1, c^2, w^4, i^6, h^1, A^1, B^1\}$
A:	9	YES.	$\{p^1, c^4, w^5, i^7, h^1, A^1, B^1\}$
B:	10	I$_h$ know what THEY$_P$ think about various things$_t$.	$\{p^0, t^1, c^6, w^6, i^8, h^1, A^1, B^1\}$
	12	SO,	$\{p^0, t^1, c^8, w^7, i^9, h^1, A^1, B^1\}$
	13	I$_h$'ll show them$_p$ that$_t$'s what I$_h$ (nuclear tone) think	$\{h^0, p^0, t^1, c^{10}, w^8, i^{10}, A^1, B^1\}$
A:		<m>	
B:	14	and they$_p$ were NAIVE enough to be taken by it.	$\{h^1, p^0, t^1, c^{12}, w^{10}, i^{11}, A^1, B^1\}$

From 8 on speaker B speaks as if he were the person he referred to by „he“ in his utterances 1, 3, 4, and 6. The weak pronoun „it“ in 14 refers anaphorically to the abstract entity of „showing“ introduced in 13.

Notes

1. See (Kruijff/Schaake 1995) for an application of the TFA-based approach in dialogue analysis, and (Kruijffová/Hajičová 1997) for a comparison of the TFA-based approach with the centering theory (Grosz et al. 1995), which offers a similar approach to tracking attention changes in discourse.
2. A cognitively „given“ entity can be referred to by a contextually non-bound item if it is being chosen from a set of alternatives. On the other hand, a contextually bound item need not always be coreferential with a co-textual antecedent; it may refer to an entity made salient by the situation of the discourse.
3. For the sake of clarity, we employ the following convention of pronominal reference to the dialogue participants: the pronominal forms „she“, „her“ are used to refer to the speaker of an utterance, whereas the forms „he“, „his“ are used for the hearer.
4. It should be emphasized that these values are only tentative and that in a more definite proposal one should work with a wider scale and a more subtle differentiation on it. What is important about these numbers are their relative values: 1 represents activation degree higher than 2 but lower than 0. The rules have been formulated for those entities in the stock of shared knowledge that are referred to by nouns, nominal groups or pronouns; in this stage of investigation we leave aside references to elements such as properties, states and events.
5. For the sake of perspicuity, we work with the essential rules for activation assignments discussed in Hajičová (1993). In our current investigation, we have not yet taken into account the amendments concerning activation assignments in sentences with a more complex structure proposed recently by Hajičová et al. (1995).
6. There are four dialogues presented in the Appendix, which we use as examples demonstrating the phenomena we mention in this Section. Our references to the examples have the form D/U, where D stands for the dialogue number and U stands for the number of utterance within a dialogue.
7. The entities can be concrete or abstract, or entities somewhere in between on the scale of world immanence (as Asher (1993) discusses). They may correspond to objects in „the real world“, in some „imaginary world“, to concepts in a „mental model“, etc. We assume that a participant’s cognitive state is structured, but a discussion of the possible structure(s) is beyond the scope of our present paper.
8. Note that dialogue participants do not necessarily share the same situational context, e.g., during a telephone conversation.
9. The notion of SSDK should be understood as an analytical tool which does not bear straight cognitive implications as for the actual existence of suchlike structure.
10. The „fading“, „enduring“ or „recalling“ of the activation degree of a particular entity will correlate with discourse structure. For instance, previous activation degree(s) might be resumed at a boundary of an episode, which appears to be the case in II/18.
11. The schemes of activation degree changes were drawn using a programme in Borland Delphi made by our colleague, Tomáš Holan, whom we wish to thank this way.

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