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Topic-Comment Structures
in
Information Dialogues

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Topic-Comment Structures in Information Dialogues

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Abstract:

This paper shows that the topic-comment distribution in natural language utterances and the use of the syntactic structures left-dislocation, topic topicalization and right-dislocation contribute to directing, maintaining, shifting and redirecting the attentional focus in dialogues. The arguments are based on an empirical study of a corpus of 111 spoken information seeking dialogues.

I INTRODUCTION

An important characteristic of human communication is the efficient use it makes of the great amount of linguistic and world knowledge. Immediately from the beginning, the dialogue partners seem to be capable to direct their attention towards only that part of the knowledge they need in order to come to the correct interpretation of utterances in the dialogue. The thesis of this paper is that one of the ways in which speakers achieve such a result is by clear and purposive language use.

The thesis is based on an empirical study of a corpus of 111 spoken information seeking dialogues. These are telephone conversations recorded from the information service of Schiphol Airport. Information is exchanged about flights, and things that have to do with flights, e.g. passengers, luggage, etc. A typical example of such an information dialogue is the following:

**2063

1 I:	Inlichtingen Schiphol.	(Schiphol Information.
2 S:	Ja,	Yes,
3	u spreekt met de Wjl.	you are speaking with de Wjl.
4	Vlucht KL 550,	Flight KL 550,
5	hoe laat is die gepland?	for what time is it scheduled?
6 I:	Die wordt nu definitief verwacht om vijf voor twaalf.	It is now definitely expected at 11.55.
7 S:	Vijf voor twaalf?	11.55?
8 I:	Ja hoor.	Yes.
9 S:	Oke,	Okay,
10	bedankt.	thank you.
11 I:	Tot uw dienst.	You're welcome.
12 S:	Dag.	Goodbye.
13 I:	Dag.	Goodbye.)

As its name suggests, the principal goal of an information seeking dialogue is the exchange of factual information: there is an information service whose task is to give information about a certain domain and there is an information seeker whose goal is to obtain some information about that domain. The communicative goal of the information seeker, which is usually motivated by some underlying noncommunicative task he has to perform, is the driving force behind the communication. Characteristic of the dialogues in the corpus is that the domain can be determined relatively easily. Also the communicative goals to be achieved are relatively clear. This makes the dialogues an appropriate starting point for a

study of the way in which language use contributes to the information exchange.

The study shows that speakers seek to present very clearly the entity they want to communicate about (the topic or the focus of attention) and what they want to communicate about it (comment). Also they try to be coherent. They aim to connect their utterances in such a way that they attach discourse-new information to the points of attachment reached by preceding utterances. Furthermore, they make use of special syntactic structures to mark explicitly shifts in attention. In this way, the dialogues give a relatively clear picture of how the topic-comment distribution in natural language utterances and the use of special syntactic structures contribute to directing, maintaining, shifting and redirecting the attentional focus in the dialogues.

II METHOD OF ANALYSIS

To understand the meaning of the utterances in a naturally occurring spoken dialogue a syntactic and semantic analysis is not enough. Speaker's meaning is not captured completely by semantic content alone. What one needs in addition is the communicative function of the utterance in the context of the dialogue.

For this reason the dialogues are viewed from an action perspective. The basic units of analysis are taken to be utterances, that is sentences or other grammatical forms (words or phrases) which express one or more dialogue acts. The meaning of a dialogue act is understood as a context-change potential. The dialogue context is extended and updated as a result of dialogue acts, which means that the semantic content of an utterance is integrated into the dialogue context according to the function of the dialogue act.

Dialogues consist not only of dialogue acts that are directly motivated by the underlying task. The majority of the acts pertain to the various aspects of interaction itself. Following Bunt(1994), dialogue acts which explicitly concern the communication itself, are called dialogue control acts. Bunt distinguishes three categories of dialogue control acts¹:

1. Linguistic Feedback. By giving feedback the speaker provides information about his processing of the partner's previous utterances. This includes information about perceptual processing, interpretation, evaluation, and dispatch.
2. Discourse structuring. Discourse structuring acts in general indicate the speaker's view of the state of the dialogue and his plan for how to continue. An important subcategory of these acts are topic management acts, explicit manifestations of topic introductions, and topic shifts.
3. Interaction management. Interaction management involves turn management, time management, contact management, own communication management, and social obligations management.

If we apply these categories to the example dialogue, we see that it does indeed consist mostly of dialogue control acts.

**2063

- | | | | |
|---|--|-------------------------------|--------------------|
| 1 | I: Schiphol Information. | Social obligation management, | self-introduction |
| 2 | S: Yes, | Feedback, | acceptation |
| 3 | you are speaking with de Wjl. | Social Obligation management, | selfintroduction |
| 4 | Flight KL 550, | Topic management, | topic introduction |
| 5 | for what time is it scheduled? | | |
| 6 | I: It is now definitely expected at 11.55. | | |

7 S:	11.55	Feedback,	check
8 I:	Yes.	Feedback,	confirmation
9 S:	Okay,	Feedback,	acceptation
10	thank you.	Social obligation management,	thanking
11 I:	You're welcome.	Social obligation management,	reply to thanking
12 S:	Goodbye.	Social obligation management,	greeting
13 I:	Goodbye.	Social obligation management,	greeting

Only two utterances, numbers 5 and 6, are directly motivated by the underlying information task. These kind of acts, in this case a factual wh-question and de factual wh-answer are called task-oriented informative acts.

The topic-comment structure will only be described for task-oriented informative acts and dialogue control acts with a semantic content that concerns the exchange of factual information about the domain. So for our purposes, only utterances 4,5,6, and 7 of the above mentioned dialogue are important.

III TOPICAL STRUCTURE

The general linguistic point of view is that a semantically coherent discourse is about a certain topic, that is a central concept that is elaborated by the utterances of the discourse². In fact, two notions of topic are distinguished which form the basis for respectively the local and global coherence of a discourse: utterance topic and discourse topic³ (Reinhart 1980). The first notion is used to describe the linear concatenation of utterances in a dialogue. The second notion is used to describe the way in which groups of coherently related utterances, discourse segments, hang together to form a whole. This paper will concentrate on local coherence. The notions of topic and comment will be used to describe the linear connectedness between the utterances in a dialogue.

An intuitively appealing way to define the notions of topic and comment for dialogue acts is in terms of aboutness (Compare Gundel (1985), p.86):

An entity, T, is the topic of a dialogue act, D, iff D is intended to increase the addressee's knowledge about, request information about, or otherwise get the addressee to act with respect to T.

Information, C, is the comment of a dialogue act, D, iff C is "...what is actually communicated, i.e., asserted, questioned with respect to the topic."

These definitions assign specific communicative functions to the topic and the comment of an utterance. The topic serves as a sort of peg or a point of attachment to which information, the comment, is attached. Topics and comments can be seen as the basic building blocks for the gradual process of information exchange in the dialogue. For each informative act there is an implicit or explicit point of attachment (a topic) to which discourse-new information (a comment) can be attached. The topic-comment structure of the dialogue describes how the various topics and comments are connected.

For analyzing naturally occurring dialogues, however, these definitions are still too vague. One needs more concrete rules for determining the topic of an utterance. A fruitful approach proved to be that of functional grammar (Halliday 1985, Downing 1991, Lowe 1987), which distinguishes for each grammatical unit (clause or clause complex) a theme and a rheme. The theme is what the speaker selects as the point of departure of his utterance. The remainder of the message, the part in which the theme is developed, is called rheme⁴. In

general, the thematic structure is expressed by word order- whatever is chosen as the theme is put first. Theme is a much broader notion than topic. In fact the topic is one of its optional ingredients.

Theme is a contextual notion. It can contain several "connectors", which stipulate from the outset how the clause has to be connected with the context. It can include an indication of how the rest of the utterance is connected with preceding utterance(s), it can set the framework within which the rest of the utterance and even utterances that follow must be interpreted, or both. Possible connectors are:

1. an indication of the communicative function(s) the utterance will express,
2. an expression of the structural and/or semantic relation of the utterance with the preceding context,
3. an expression of the spatio-temporal context in which the semantic content of the utterance must be interpreted, and
4. the topic, the entity about which the utterance is communicating something.

Usually the connectors occur in this order. Each of them is optional.

Although the notion of theme includes more than the notion of topic and the topic is not always part of the theme⁵, the rule that the topic can generally be found at the end of the theme proved applicable for most of the utterances in the corpus. Example **4258 below illustrates the application of this rule.

**4258

		Theme		Rheme	Theme		Rheme
			Topic			Topic	
4	S:	Weet u ook			(Do you know		
5		of	het toestel		if	the plane	
6			dat eh..	van de AL Italia		that uh..	of the AL Italia
7			dat	is vertrokken uit Rome om tien over tien		that	departed from Rome at ten past ten
8		of	dat	al binnen is?	if	it	has arrived yet?
		(...)					
11	I:	Eh..	die	gaat om half een landen	Uh..	it	is going to land at a half past twelve
12		dus		over twee minuten	so		in two minutes
13	S:	O,		nog twee minuten	O,		two more minutes)

The example shows that the topic inherits the contextual characteristics of the theme. The topic of utterance 5 sets the framework within which the ensuing utterances must be interpreted. On the other hand, the topics of the ensuing utterances, numbers 7,8,11,12, and 13, link up with the preceding context by means of a pronoun. The example illustrates as well how topics form a connecting thread in a dialogue and as such contribute to the semantic coherence of the dialogue.

In fact, there are different ways in which topic-comment structures provide the semantic coherence between utterances. This will be explained by describing the role of the most basic topic-comment structures in maintaining, shifting, and redirecting the attentional

focus of the dialogue. These basic topic-comment structures are the following (Daneš 1974, Scinto 1981):

1. Topic repetition, in which case the topic of one utterance is repeated in the next utterance. Graphic representation:

```

U1 T1    ---- C1
  |
U2 T1    ---- C2
  
```

In the corpus about half (53%) of the topic repetitions are lexicalized and almost half (47%) are ellided. Table 1 below shows how many and which anaphoric expressions are used to continue the topic. The notion of anaphor should be taken very broad here. It comprises identity anaphora, subsectional anaphora and relational anaphora (van Deemter(1991)), both full NPs and pronouns.

Table 1: Topic repetitions

	Total	Identity anaphora	Subsectional anaphora	Relational anaphora	Deleted
Topic repetitions	675	297	27	36	315

2. Themmatization of the comment, where (the newest part of) the comment of a prior utterance is taken as the topic of the succeeding utterance. Graphic representation:

```

U1 T1    ---- C1
  |
U2      T2(=C1) ---- C2
  
```

This pattern is used both for temporary and for permanent topic shifts. A temporary topic shift is a shift that lasts for only one utterance. Graphic representation:

```

U1 T1    ---- C1                U1 T1 ---- C1
  |      |                       |
U2 |      T2(= C1) ---- C2      U2      T2(= C1) ---- C2
  |                                     |
U3 T1    ---- C3                U3                                     T3(=C2) ---- C3
  
```

A permanent topic shift reaches further than one utterance. Graphic representation:

```

U1 T1    ---- C1
  |
U2      T2(= C1) ---- C2
  |
U3      T2          ---- C3
  
```

Table 2 below shows that this structure is equally used for both temporary topic shifts and permanent topic shifts:

Table 2: Comment themmatizations

	Total	Temporary Topic Shifts	Permanent Topic Shifts
Comment themmatizations	78	37	41

3. Topic iteration with comment iteration, where the comment of a previous utterance is

partially iterated and informationally enriched by the comment of the succeeding utterance.
Graphic representation:

```

U1   T1   ----   C1
      |           |
U2   T1   ----   C2(>C1)

```

A special case of this pattern is the situation where the (partial) representation of U1 is thematized by pronominalization. The graphic representation is then:

```

U1     T1  ----  C1
      |     |
U2 T2(= ( T1  ----  C1))  ----  C2(>C1)

```

As will be clear from the explanation above, the topic of the following utterance, U3, will be T1 in case of a temporary topic shift, and T2 in case of a permanent topic shift. Table 3 shows that this last pattern mostly causes temporary shifts:

Table 3: Topic+Comment thematizations

	Total	Temporary Topic	Permanent Topic
Topic+Comment thematizations	70	51	19

The following example shows how these basic structures work together in a dialogue:

**4379

1 I:	Informatie Schiphol.	(Schiphol Information	
2 S:	Ja, goedemo...middag mevrouw.	Yes,goodmo...afternoon madam	
3	Kunt u mij misschien ook zeggen	Can you tell me	
4	is het toestel uit Dubrovnick,	Is the plane from Dubrovnick	T1
5	de JU 222,	the JU222	T1
6	die om twaalf uur twintig op	that should arrive at Schiphol	T1 --- C1
	Schiphol zou komen,	at 12.20	
7	is die al geland?	has it landed yet?	T1 --- C2
8 I:	Even kijken,	I'll have a look	
9	een ogenblikje.	just a moment	
10 S:	Alstublieft.	???	
11 I:	Hallo.	Hello	
12 S:	Ja mevrouw.	yes,madam	
13 I:	Nou ik heb wel de JU 222 gehad,	Well, I have had the JU 222	T2 --- C3
14 S:	Ja	yes	
15 I:	maar die komt niet vanuit .	but it doesn't come from	T3(=C3) --- C4
	Dubrovnick	Dubrovnick	
16 S:	O,	O	
17	waar kwam die dan..	where did it then..	T3 --- C5
18	uit Zagrev?	from Zagrev?	T3 --- C6
19 I:	Ja.	yes	
20 S:	Ja, das ook goed.	Yes, that is all right too	T4(=(T3 --- C6)) --- C7
21 I:	Ja, die is geland hoor	Yes,it has landed	T3 --- C8

22	kwart voor een	a quarter to one	T3 --- C9
23 S:	Kwart voor een.	a quarter to one	T3 --- C9
24	Fijn,	Fine	
25	dank u wel.	Thank you very much	
26 I:	Tot uw dienst hoor.	You are welcome	
27 S:	Dag mevrouw.	Goodbye madam	
28 I:	Dag mevrouw.	Goodbye madam)	

Dialogue **4379 demonstrate how the topic-comment distribution in natural language utterances contributes to maintaining, shifting, and redirecting the attentional focus in dialogues. The maintenance is done by topic repetitions, the shifts by comment topicalization and pronominalization of a preceding utterance. At two places in the dialogue the focus is redirected to the topic introduced in the beginning of the dialogue by employing the points of attachment the preceding topic-comment structure provides. That is in utterance 14 and 21. The dialogue illustrates the general preference for maintenance of the attentional focus that was introduced at the beginning of the dialogue. In fact, this tendency holds for the whole corpus.

Utterances 4 and 5 show another device for manipulating the focus of attention, which is a left dislocation construction. The following section will show how the syntactic constructions left-dislocation, topicalization, and right-dislocation direct or re-direct the attentional focus of the dialogue.

IV EXTRACTED TOPICS

To direct the attention of the dialogue partner, speakers have the possibility to perform an explicit topic management act by dislocating the topic from what is communicated about it. The syntactic structures that can be used to perform the dislocation are:

1. Left-dislocation, i.e. an NP, PP or CP is moved in front of the sentence and in the open sentence its place is occupied by a pronoun. Example:

**2063

4 S:	Vlucht KL 550,	(Flight KL 550,
5	hoe laat is die gepland?	for what time is it scheduled?)

2. Topicalization, i.e. an NP, PP or CP is moved in front of the sentence leaving a gap at the place of the fronted constituent⁶. An example from the corpus:

**4505

7 I:	voor die prijzen	(For those prices,
8	kunt u beter een ander nummer bellen.	you can better call another number.)

3. Right-dislocation, i.e. an NP, PP or CP is moved to the end of the sentence and in the open sentence its place is occupied by a pronoun. Example:

**5503

11 S:	dat kan ook,	(that is also possible,
12	dat ze via Parijs gaan.	that they go via Paris)

If the speaker uses one of these constructions, he shows explicitly what he intends to communicate something about (i.e. the topic) and what is actually communicated, i.e. asserted, requested etc., about it (the comment)(Gundel 1985). The constructions are used where the dislocated referent is not the current topic. By applying the dislocation the speaker brings the referent into the attention of the listener and makes it the topic.

Table 4 shows the use of these topic extraction constructions in the corpus. It also shows their contribution to the topical structure of the dialogue and the informative status of the dislocated entity.

Table 4: Topic extractions

	Total	Topic Introductions	Temporal Topic Shifts	Permanent Topic Shifts	Discourse-New Entity	Discourse-Old Entity
Left-dislocations	62	44		18	56	6
Right-dislocations	5		5			5
Topic topicalizations	13		8	5	7	6

We see that topic topicalizations were used both for temporal topic shifts and permanent topic shifts, right-dislocations only for temporal topic shifts and left-dislocations for topic introductions and permanent topic shifts. The effect of a left-dislocation is most penetrating. In all cases, so also in cases of a topic introduction, the left-dislocated entity remains the point of attachment for more than one utterance.

The table also gives an impression of the given-new status of the dislocated entities. A discourse-new entity is an entity that is introduced in the discourse for the first time. An discourse-old entity is an entity that was mentioned earlier⁷.

We see that left-dislocation is mostly used to introduce discourse-new entities. Also a relatively great amount is used to introduce the first topic of the dialogue. In fact, 44 of the 111 dialogues start with a left-dislocation. This shows that it is an important instrument to direct the attention of the dialogue partner towards the discourse element that will be elaborated by the utterances that follow.

V CONCLUSION

To conclude, the description of the distribution of topic-comment structures in information dialogues and the use of special syntactic constructions shows how language users direct, maintain, shift, and redirect their focus of attention. In general the maintenance of the attentional focus is preferred. Direction, shifts, and redirection is generally done by comment thematization, topic-comment thematization and the topicalization structures left-dislocation, topic-topicalization, and right-dislocation.

NOTES

1. See Bunt(1994) for a more extended description.
2. The notions of attentional focus (Sidner 1979) and center (Grosz et al. 1983) are used to describe the same phenomenon.
3. These notions can be compared to the notions local focus and global focus used by Grosz et al. (1983) and Sidner (1979).
4. For elliptical utterances the thematic structure must be derived by means of the context.
5. The topic is for instance not part of the theme in case of a focus topicalization.
6. In the corpus there are three kinds of topicalization:

1. topic topicalization, which is the topicalization of a topic,
2. focus topicalization, which is the topicalization of the new information, and
3. topicalization of a spatio- or temporal adverb.

The topicalization that is talked about here is topic topicalization.

7. Crucial in understanding what a discourse-new entity is, is the point that it wasn't talked about earlier in the discourse. It doesn't mean that the speaker assumes that the dialogue partner has no previous knowledge about it.

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