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## **TOPIC-BASED ANALYSIS OF CLASSROOM DISCOURSE**

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### **Abstract**

Discourse analysis has largely focused on function at the expense of content. This paper attempts to redress the balance by providing an analysis of classroom discourse by identifying the topics in the discourse and following their development. To identify topics, bottom-up approaches based on theme-rheme progression and lexical networks were used together with a top-down schematic approach producing semantic networks of keywords. Having identified topics, topic development can be followed through the semantic network and categorised as topic maintenance, topic drift, topic shift, topic renewal or topic insertion. To illustrate the effectiveness of such an approach, an extract of classroom discourse from an EST course at a Thai university was analysed. Classroom discourse was chosen because of the importance of content structure to the effectiveness of such discourse, especially for explanations and eliciting. The analysis shows that identifying topics and following topic development are possible and may lead to a deeper understanding of the structure of classroom discourse.

## **INTRODUCTION**

The analysis of discourse can be divided into analyses of the function and analyses of the content of discourse (Widdowson, 1984). Thus Sinclair and Coulthard's (1975) classic study of classroom discourse, genre analysis (Bhatia, 1993; Hyon, 1996;

Swales, 1981, 1990), text analysis (Crombie, 1985a, 1985b), and speech act theory (Austin, 1962/1976; Searle, 1969) all focus on the functions expressed in discourse. Analyses of content, on the other hand, are less common. Hoey's (1991) lexical analysis and much of the work of text grammarians attempt to describe patterns of content in discourse.

Similar distinctions between foci on function and content can also be found in work in the areas of coherence and schema theory. Coherence can be classified into interactional coherence, which focuses on functions, and propositional coherence, which is concerned with the content of propositions (Lautamatti, 1990). Similarly, textual schemata are knowledge structures of rhetorical organisation or large-scale function, and content schemata are knowledge structures of content (Carrell and Eisterhold, 1988; Kitao, 1990).

Both function and content play vital roles in communication, but there has been an emphasis on the study of function at the expense of investigating content in discourse analysis. This is surprising since content is such a crucial aspect of communication. Except for phatic communication, content is a vital component of every interaction (van Lier, 1988) – it is difficult to imagine any meaningful interaction without a topic. Similarly, the topic is a crucial aspect of context (Hymes, 1974), which all investigation of communication in the real world must consider.

Furthermore, topics have a direct impact on how language is used. Topics can affect people's productive performance, such as how fluent they are or how closely they approximate Standard English (Cazden, 1970). Topics also influence understanding, so that it is easier to understand discourse on familiar topics than on unfamiliar topics, largely due to the ease of recognising how words and phrases relate to the given topic and how the topic is expressed (Minsky, 1985). Finally, and more tentatively, it has been suggested that topics, as the basis for categorisation and schemata, are central to thinking (Lakoff, 1987) and thus to language. The centrality of topics to thinking is such that failure to adhere to a topic is taken as evidence of mental incapacity (Chaika, 1989).

Since topics exert such an influence over how language is used, we need to consider why discourse analysis has not paid more attention to topics. The reasons for this omission, however, are not hard to find. Topics are notoriously difficult to pin down, so much so, in fact, that even a satisfactory useful definition of the term is elusive. Some definitions simply replace the term, *topic*, with an equally elusive, intuitively-based definition such as "subject" (Bygate, 1987: 117) or "whatever it is that is being talked about" (Brown and Yule, 1983: 62). Other definitions of topic depend on perspective. Thus semantically a topic is a set of related propositions (Crookes and Rulon, 1988; Keenan and Schieffelin, 1976; van Dijk, 1977); pragmatically, we can stipulate that interlocutors must be aware of and identify the same set of propositions as being a topic (Hatch, 1992); and from a discourse perspective topics can be identified as stretches of language marked by lexical (e.g. *by the way*) or phonological (e.g. changes in pitch) boundaries (McCarthy, 1991).

In this article, I will be taking a semantic approach to topics, since the pragmatic approach is predicated on the semantic concept of a set of related propositions, and lexical and phonological topic boundaries in discourse are incidental rather than

defining characteristics of topics. Such boundaries may help us to identify topic change, but they are not always present, as we shall see when we look at topic development below. The semantic notion of topics as sets of related propositions, then, is the primary defining characteristic of topics.

A further characteristic of topics which mitigates against analysis is that, although it is tempting to view topics as static hierarchies consisting of subtopics and subsubtopics, the unfortunate reality for any investigator is that topics are constantly in a state of flux (Hudson, 1980).

In any investigation of topics in discourse, then, there are two aspects of topics which require examination. Firstly, we need to be able to identify the topics involved in a particular stretch of discourse; and secondly, we must be able to follow how topics develop and change through the discourse.

### TOPIC IDENTIFICATION

Topics can be identified in ways similar to bottom-up and top-down processing. A bottom-up identification of topics relies on identification of predominant keywords (Scott, 1997), while top-down identification concerns schema theory. I will look at each of these in turn.

In the literature there are two approaches which can be used for bottom-up topic identification. The first builds from the level of sentence where sentence topic and comment, or theme and rheme, can be identified (see Halliday, 1970; Lock, 1996). The second focuses on key lexical items which recur with a frequency indicative of a topic.

#### *Bottom-up topic identification based on theme-rheme*

Turning first to theme-rheme (terms I will use rather than topic-comment to avoid confusion) analysis, a theme is “what the sentence is about” and a rheme is “what is said about [the theme]” (Connor, 1996: 81). Associated with the work of Michael Halliday (e.g. 1970, 1973), these two concepts have been used extensively in linguistics.

The importance of theme-rheme analysis concerns how consecutive sentences are related (Fries, 1983). Lautamatti (1978) has suggested that there are three ways in which themes and rhemes can link sentences. Firstly, there is sequential progression where the rheme of one sentence becomes the theme of the succeeding sentence, which we can write as  $\langle\langle a,b\rangle,\langle b,c\rangle,\langle c,d\rangle,\dots\rangle$  (van Dijk, 1977). Secondly, the theme of one sentence can be repeated as the theme of the next sentence. Such progression is termed parallel progression and can be written as  $\langle\langle a,b\rangle,\langle a,c\rangle,\langle a,d\rangle,\dots\rangle$ . Extended parallel progression, the third type, occurs when a previous theme, which may have been interrupted is taken up again, as in the sequence  $\langle\langle a,b\rangle,\langle b,c\rangle,\langle c,d\rangle,\langle a,e\rangle,\dots\rangle$ , where  $a$  is reintroduced. To these three types of progression, we need to add coherence breaks (Wikborg, 1990), where a previously unmentioned theme is introduced, such as  $d$  in the sequence  $\langle a,b\rangle,\langle b,c\rangle,\langle d,e\rangle,\dots\rangle$ .

Longer utterances in spoken discourse may include several nested levels of theme-rheme relations (Caron-Pargue and Caron, 1991), in many of which previous themes

and rhemes may recur. By concentrating on such recurrence of themes, we may be able to construct a hierarchical structure for an utterance with themes embedded in higher level superordinate themes with marked themes (Lock, 1996) functioning at the highest level. Thus, by looking at recurrence and interconnections between themes and rhemes, individual sentence themes can be grouped together under superordinate themes. These superordinate themes may be considered the topic of the stretch of discourse.

#### *Bottom-up topic identification based on lexical networks*

An alternative bottom-up approach to topic identification is to look at relationships between lexical items in a stretch of discourse so as to draw up a network of bonds between the lexical items, as shown by Hoey (1991) and de Beaugrande and Dressler (1981). Hoey's analysis is the easier to conduct since he only considers reiteration of lexical items through repetition, paraphrase or the cohesive devices such as reference, and ellipsis suggested by Halliday and Hasan (1976). De Beaugrande and Dressler's analysis, on the other hand, is more comprehensive, more subjective and far more difficult to conduct on a long stretch of discourse since all possible relationships, such as *instrument of* and *purpose of*, are considered.

In both approaches, having identified the relationships between lexical items, a network of lexical bonds can be constructed, and the density of linkage between items in such a network is indicative of the topic (de Beaugrande and Dressler, 1981). In other words, lexical items which recur most frequently or which are most frequently linked to other items are likely to be the topic of the stretch of discourse.

#### *Top-down topic identification*

While bottom-up approaches may help us to identify topics, if we are to understand how topics are introduced and developed, we must also consider topics from a top-down perspective. Of particular relevance here is schema theory. Schemata, also called scripts (Schank and Abelson, 1977), frames (Minsky, 1985; van Dijk, 1977), expectations (Tannen, 1978) and points (Wilensky, 1986), are background knowledge structures which represent the relationships between components of knowledge (Anderson and Pearson, 1984; Carrell and Eisterhold, 1988; Cook, 1994). As topics are sets of related propositions and these propositions represent components of knowledge, schemata should provide us with a useful approach for understanding topics.

As we saw in the introduction, two kinds of schemata are usually distinguished. Textual schemata describe function in discourse, while content schemata, as their name implies, describe content. It is on the latter, then, that we need to focus in our investigation of topics. Content schemata are usually described in terms of one overall schema containing a series of slots (Hudson, 1982) or terminals (Minsky, 1985) which will be filled as the discourse progresses. For example,

(1) John went to a restaurant.

Activates a 'restaurant schema', one terminal of which is 'customer' which *John* in sentence (1) fills. Schemata such as this are frequently represented in tabular form as shown in Figure 1.

Restaurant schema			
Terminal:	Customer	Food ordered	Cost
Filled by:	John		

Figure 1 Tabular form of restaurant schema

In this article, however, I will use line diagrams, also called tree diagrams (Burgess, 1994), to represent schemata, since these highlight the semantic relations between topics so a nested hierarchy of levels can be created similar to the semantic networks which arguably underpin cognition (Collins and Quillian, 1969; Carrell, 1988). Furthermore, line diagrams allow us to follow developments in topics clearly (Watson Todd, 1997b). The table above can be redrawn as a line diagram as in Figure 2:

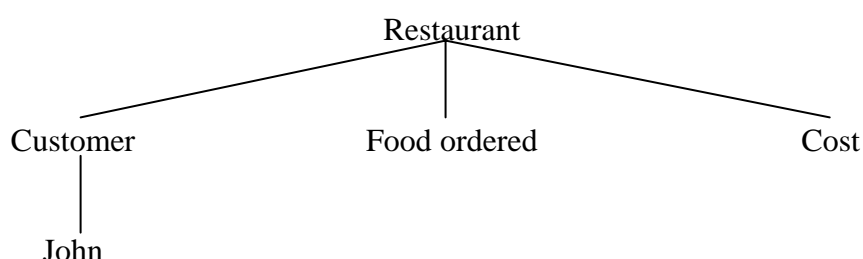


Figure 2 Line diagram of restaurant schema

Identifying the schema activated for any particular stretch of discourse is problematic, since different people's interpretation may differ depending on what they find relevant to their own interests (see Sperber and Wilson, 1986; Wilson, 1994). The identification of schemata is therefore somewhat subjective. Nevertheless, in some contexts it may be possible to identify schemata with a high level of reliability. In a classroom, for instance, the teacher usually has almost complete control over the topics to be covered in a lesson. This control may be manifested through asking questions which restrict learners' responses (Kress, 1989), reformulating 'inconvenient' responses so that they match the teacher's agenda (Johnson, 1995), ignoring learners' wishes concerning the topic (Hudak, 1987; Moita Lopes, 1995), and explicitly previewing the topics to be covered at the beginning of the lesson (Hatch and Long, 1980; Watson Todd, 1997a). The latter technique is similar to the use of titles and headings in lectures and books which allow the listener/reader to generate expectations about the content of the discourse (Nunan, 1991). These expectations take the form of schemata, so in a situation such as a classroom where a preview of content may be given, it should be possible to identify the intended schemata, and thus possible topics, from a top-down perspective.

#### TOPIC DEVELOPMENT

Being able to identify topics, however, is not enough. As we saw above, topics are not static, but may change frequently through any given stretch of discourse as they are negotiated in the interactional process. We therefore need to look at how topics develop through discourse.

Topics are dynamic and may change frequently through discourse either by gradually drifting from one topic to the next with no perceptible break or by an abrupt shift where the topic change is usually clearly marked (Hudson, 1980). Keenan and Schieffelin (1976) in their seminal paper on topics, term discourse where there is no abrupt shift “continuous discourse” and discourse with abrupt shifts “discontinuous discourse” (p. 342). These categories, however, can be broken down further.

Continuous discourse may take the form of topic maintenance, where the same topic is retained through a stretch of discourse. Alternatively, the topic may drift with each discourse act being semantically related to the previous one, but the overall topic gradually changes. For instance, Rost (1994: 90) contains the following example:

- (2) A: Guess what? I saw Eriko at the supermarket on Sunday.  
B: Did you? I didn't know the supermarket was open on Sunday.

Rost argues that A probably wanted to initiate the topic of *Eriko*. From A's statement, however, B is given the option of continuing the discourse on the topics of either *Eriko* or *the supermarket*. Continuing on *Eriko* would match A's preferred choice and maintain the topic. B, however, chooses *the supermarket* and changes the topic, but since B's response is semantically related to the previous discourse act, the topic change is classified as topic drift.

Hurtig (1977) and van Dijk (1977) have attempted to describe the phenomenon of topic drift in logical terms. In example (2), this would require setting *Eriko* and *the supermarket* as topic parameters each delimiting a range of semantic space in which at least one proposition of the subsequent discourse acts must be situated for the discourse to be considered continuous. Such an approach allows us to distinguish between topic drift and the other kinds of topic change.

Discontinuous discourse involves larger ‘jumps’ between topics. These may take the form of shifts where the topic is changed with no shared propositions between discourse acts. Such shifts may be signalled explicitly by metadiscoursal markers giving coherent topic shift, or they may be unsignalled creating noncoherent shift. Alternatively, the topic may shift back to a previously active topic giving topic renewal. Finally, an exchange on a different topic embedded in an otherwise monotopical stretch of discourse is termed topic insertion and is similar to the insertion sequences described in conversation analysis (Coulthard, 1977).

To categorise discontinuous discourse, then, as well as examining patterns of topics in succeeding discourse acts, we also need to consider metadiscoursal markers. Phrases such as *by the way* and *as I was saying*, as well as certain patterns of intonation, do not necessarily add propositional content but help to organise the discourse (Connor, 1994; 1996). Although metadiscoursal markers do not help us to identify what is underlying topic selection and topic change, as explicit markers of an internal process of organising discourse they often give us signals about topic shift, topic renewal and topic insertion. *By the way*, for example, can be used to signal topic insertion (Quirk and Greenbaum, 1973). In the classroom, framing and focusing moves usually perform the function of metadiscoursal markers (Sinclair and Brazil, 1982). As we saw earlier, McCarthy (1991) suggests that topics are stretches of discourse bounded by metadiscoursal markers, but the phenomena of topic drift and noncoherent topic

shift show that topic boundaries do not need to have metadiscourse markers. Metadiscourse, then, can be taken as a sign of topic change but is not a necessary condition for such change.

To summarise topic development, following Crow (1983) there are six ways in which topics may progress over a stretch of discourse:

1. Topic maintenance
2. Topic drift
3. Noncoherent topic shift
4. Coherent topic shift
5. Topic renewal
6. Topic insertion

and the latter three of these can be indicated by metadiscourse markers.

### TOPICS IN CLASSROOM DISCOURSE

In this paper, the topics in a stretch of classroom discourse will be analysed. But why should we analyse topics in the classroom rather than in any other kind of discourse? There are two main reasons for this.

Firstly, classroom discourse has certain characteristics that make it more amenable to analysis than other kinds of discourse. This is largely due to the differences in power between the teacher and the learners in the classroom which provides the driving force behind the institution of education (Kress, 1989). This power, as we saw above, enables the teacher to control topics in classroom discourse. While this may seem to be dictatorially imposing on the learners, it does provide one great advantage for the researcher. By giving classroom discourse a more overt structure and by giving control to one participant only, the teacher's power in the classroom provides a situation amenable to investigation which may make analyses of classroom interaction productive and valuable (Sinclair and Coulthard, 1975).

The second reason for investigating the classroom is that topics and their sequencing are crucial to the effectiveness of education. For every subject, including language teaching, the "pattern of relationships is what the subject is all about" (Lemke, 1989: 24), and this pattern of relationships is learnt through the implicit framework of knowledge created in the classroom (Brumfit, 1994), which itself is created through the organisation of topics both within classroom discourse and within the curriculum. Thus which topics appear in classroom discourse and the sequencing of these topics are vital to the success of the teaching/learning process and are reflected in the structuring of classroom interaction. Consistently structured classroom interaction, it has been demonstrated, leads to more successful lessons (Wong-Fillmore, 1985), higher learner perceptions of teacher clarity (Cruickshank, 1985), and higher levels of teacher confidence (Lemke, 1989). In addition, since learning involves seeing relationships between pieces of knowledge, structuring classroom discourse helps learners to fit new knowledge into cognitive structures analogous to schemata (Ausubel, 1963) and to link internal learning processes with instructional events that promote learning (Gagne, 1985).

### *Topics in explanations*

Explanations are one area of classroom discourse where sequencing of propositions is of particular importance (Kennedy, 1996). Explanations involve building on knowledge familiar to the learners to enable them to grasp new knowledge (Watson Todd, 1997a). If the relationships between familiar and unfamiliar concepts are not clearly structured, then the learners' chances of understanding the explanation are reduced. Although several function-based models of explanations have been proposed (e.g. Baker, 1990; Faerch, 1986; Jantz, 1989; Yee and Wagner, 1984), I am not aware of any content-based models of explanations. Since the sequencing of concepts is crucial to the effectiveness of explanations, this is an area sorely in need of investigation.

### *Topics in eliciting*

Eliciting is another area where sequencing is vital, since eliciting usually takes the form of a series of questions which should follow a path towards the required information. Each question then should follow logically from the previous one and "only one step of logic should be taken at a time" (Watson Todd, 1997a: 71). Although it is easy to write about the need for logic in eliciting, it is less clear what the term *logic* means in this situation. In this paper, I am taking *logic* as meaning that there is a close propositional relationship between successive discourse acts. With eliciting, the succeeding questions should be closely related propositionally, i.e. the questions should be adjacent in semantic space (van Dijk, 1977). Thus the effectiveness of eliciting is predicated on the sequencing and relationships of the propositions in classroom discourse.

## TOPIC-BASED ANALYSIS OF A CLASSROOM EXTRACT

### *The data*

The extract analysed below comes from a foundation EST course at King Mongkut's Institute of Technology Thonburi, a technological university in Thailand. The lesson was loosely based around Unit 2A of *Interface* (Hutchinson and Waters, 1984: 16-19). The teacher was Thai with several years' experience of teaching the course. There were 32 learners, predominantly male, who were first year undergraduates in Mechanical Engineering.

### *The method of analysis*

Firstly, the transcription of the classroom discourse was broken into sentence-like units (which, for convenience, I will refer to as sentences). The transcription below has already been broken down in this way. Referents and paraphrases are identified, and ellipsis is filled in. After this, themes and rhemes of each sentence, together with kinds of theme-rheme progression and coherence breaks, can be identified. Lexical items can be tallied for repetition and paraphrase, and networks of bonds can be drawn up. Other salient features of the discourse can also be identified at this stage. Concentrating on the topics which emerge from the theme-rheme and lexical analyses, the relationships between these topics can be identified using the logical relationship of implication or entailment (see Watson Todd, 1997b). Line diagrams representative of schemata can then be drawn up, and the developments of topic through the discourse can be followed using these diagrams.



### *Transcription*

- T: (1) Have you ever heard about ThaiCom? (2) [Thai = You can answer this one.] (3) Yes or no?
- LL: (4) Yes.
- T: (5) Yes. (6) Everybody heard about ThaiCom. (7) When did, when was it launched to the sky? (8) Do you remember when?
- L1: (9) No. [Several learners call out unclear responses, while other learners talk together.]
- T: (10) I don't remember about the date. (11) But the month would be December, December. [One learner says something unclear.] (12) What is it? (13) What is ThaiCom?
- L2: (14) Satellite.
- T: (15) Yes, it's a satellite. (16) What kind of satellite? (17) Do you know what kind of satellite?
- L2: (18) Communication.
- T: (19) Communication. (20) [Thai = Very good.] (21) ThaiCom is a kind of communication satellite. [The teacher writes (22) "communication satellite" on the board.] Right? ... (23) It is a kind of satellite which is used for communicate, which is used for uh communicate the messages or information. [The teacher moves to her table.] (24) Now, I'm going to give you a handout on [unclear]. [The teacher starts to distribute the handout.] [15 second pause.] (25) Wait, wait, wait, coming. (26) Everybody got a sheet? (27) Now this picture shows you the telecommunications in England. (28) What forms of telecommunication are there? (29) What are their use? (30) They ask you about this... (31) First of all, let me ask you, what do you understand by *tele* ... *tele* ... telephone, telegram.
- L3: (32) Wires.
- T: (33) Uh, not with wires. (34) Telegram. (35) *Gram* means what? (36) Uh telegraph. (37) *Graph* means picture. (38) *Gram* means letter. (39) *Tele* means far, *tele*. (40) So we send the telegram a long way from place to place. (41) So we use the prefix *tele* with *graph* or *gram* or *phone*. (42) Telephone means you send the sound. (43) You send on the phone. (44) *Phone* means sound. (45) *Tele* means far. (46) So telecommunications? [The teacher nominates a learner to answer by gesturing.] (47) Telecommunications?
- L4: (48) Communication far.
- T: (49) Far communication. (50) What is far? ... (51) What is far?
- L2: (52) A long distance.
- T: (53) A long distance. (54) So telecommunication, when you communicate from long places, from place to place very far. (55) That's the meaning of telecommunications.

### ANALYSIS

Before we start analysing this transcription, it should be pointed out that there is a certain element of subjectivity in the analysis. For example, in breaking the discourse down into sentences, I have ignored *Right?* between sentences 22 and 23, and I have made many sentence breaks in sentences 34 to 39; in identifying referents, I have interpreted *Everybody* in sentence 6 as referring to everybody in the classroom, but I have interpreted *we* in sentences 40 and 41 as referring to the general population. This subjectivity weakens the analysis somewhat, but nevertheless I believe that the points

at which subjective decisions have to be made are few and do not significantly affect the analysis.

In the transcription, in sentences 1 to 23, the teacher is trying to get the learners to provide information that she could otherwise provide herself, namely that ThaiCom is a communication satellite, and thus this section is eliciting (Nunan, 1991). Sentences 24 to 26 are simply concerned with practical aspects of classroom management. Finally, in sentences 27 to 55, the teacher is providing knowledge which is apparently new to the learners and thus the section can be classified as explanation.

If we identify the themes and rhemes in the discourse, we find that there are only a few points at which coherence breaks occur. These are between sentences 19 and 20, sentences 26 and 27, and sentences 29 and 30. In fact, sentence 20 is propositionally isolated from the sentences surrounding it, and sentences 27 to 30 are bounded by the metadiscoursal markers *Now* and *First of all*. The latter set of sentences appears to be a failed attempt by the teacher to find a way into the topic of *telecommunications*, with the succeeding discourse (sentences 31 to 55) representing an alternative, more successful approach.

Another noticeable feature of the theme-rheme progression in the transcription is the high frequency of parallel progression, especially where successive sentences contain the same themes and rhemes. For example, sentences 21 to 23 and sentences 50 to 53 exhibit no theme-rheme progression. Intuitively, the number of repeated theme-rheme pairs in the transcription would seem far higher than the number which would appear in written language or in conversations. This may, in fact, be a discourse feature of classroom discourse, though this point needs further investigation.

Turning to density of linkage between lexical items in the transcription, there are a number of lexical items which predominate. Those lexical items which occur three times or more within a short stretch of the discourse thus giving high density of linkage are counted as keywords. Thus sentences 1 to 11, for example, are linked by the keywords *you*, *ThaiCom*, *when* and *launch*. We can, in fact, divide the discourse into sections in each of which certain themes predominate:

Sentences 1 – 11	<i>you, ThaiCom, when, launch</i>
Sentences 12 – 23	<i>ThaiCom, satellite, communication</i>
Sentences 24 – 26	<i>handout</i>
Sentences 27 – 30	<i>telecommunications</i>
Sentences 31 – 44	<i>tele, telephone, telegram, gram, send, you, meaning</i>
Sentences 45 - 55	<i>telecommunications, far, meaning, communication</i>

Having identified the keywords in the transcription, we can now look at the relationships between them. Since I am taking these keywords as indicative of topics and I am assuming topics are a semantic phenomenon, we must turn to semantics for help in identifying the relationships between topics. One of the most common relationships used in semantics is implication or entailment (see Hatch and Brown, 1995; Lyons, 1977; Widdowson, 1996), and this relationship can be used to identify hyponymy. For example, in sentences 12 to 23, two of the recurring themes are *ThaiCom* and *satellite*. To find the direction of implication between these two themes, we can say "If it is *ThaiCom*, it is a *satellite*", and "If it is not a *satellite*, it is not

*ThaiCom*" (i.e. X, then Y; and not Y, then not X). Thus the direction of implication runs from *satellite* to *ThaiCom*, or  $satellite \Rightarrow ThaiCom$ . From this, we can say that *ThaiCom* is a hyponym of *satellite*, and conversely, *satellite* is the superordinate of *ThaiCom*.

Hyponymy implies a "relation that holds between a specific or subordinate and general or superordinate concept" (Cicourel, 1991: 40). Thus a superordinate term may contain several hyponyms. In a similar way, we can talk about topics containing various subtopics (e.g. Hudson, 1980; van Dijk, 1977). Since we are considering themes in our analysis, we can say that *ThaiCom* is a subtopic of *satellite* and this relationship can be represented in a line diagram as in Figure 3:



Figure 3 Line diagram linking *satellite* and *ThaiCom*

Similar relationships can be identified for many of the other keywords in the transcription. There are some problems, however. For example, *you*, although frequent in the discourse, is not semantically related to the other keywords and should be taken as serving functional purposes inherent in classroom discourse. Therefore, *you* is not considered further in the analysis. A further kind of problem is that some relationships, such as that between *tele* and *telecommunications*, are not amenable to implication. In this case, since *tele* is a morpheme of *telecommunications*, I am taking it to be at a more specific level and thus counting *tele* as a subtopic of *telecommunications*.

We are now in a position to draw up a line diagram showing the semantic relationships between all of the content keywords in the discourse and to follow the sequencing of the keywords through the diagram as shown in Figure 4.

In Figure 4, the topic movements 1 to 4 from the sequencing in the transcription relate to sentences 1 to 23 and concern eliciting. From the density of linkage in Figure 4, *ThaiCom* is the topic of this part of the discourse even though it is not the superordinate concept. Similarly, for the explanation in sentences 27 to 55, *tele* is the topic. These two parts of the discourse are linked by the word *communication*, and thus, ignoring sentences 24 to 26 for the moment, the discourse is continuous. However, the fact that there are two different nuclei representing two different topics in Figure 4 precludes topic maintenance. Therefore, the sections on eliciting and explanation exhibit topic drift.

Turning now to sentences 24 to 26 concerning classroom management, the keyword *handout* is semantically unrelated to any other keywords in the discourse. Bounded by two uses of the metadiscoursal marker *Now* and a coherence break, sentences 24 to 26 exhibit coherent topic insertion within an otherwise continuous stretch of discourse. Similarly, the coherence break before sentence 20 (not shown in Figure 4) and the lack of relation with the surrounding discourse indicates that sentence 20 exhibits topic insertion.

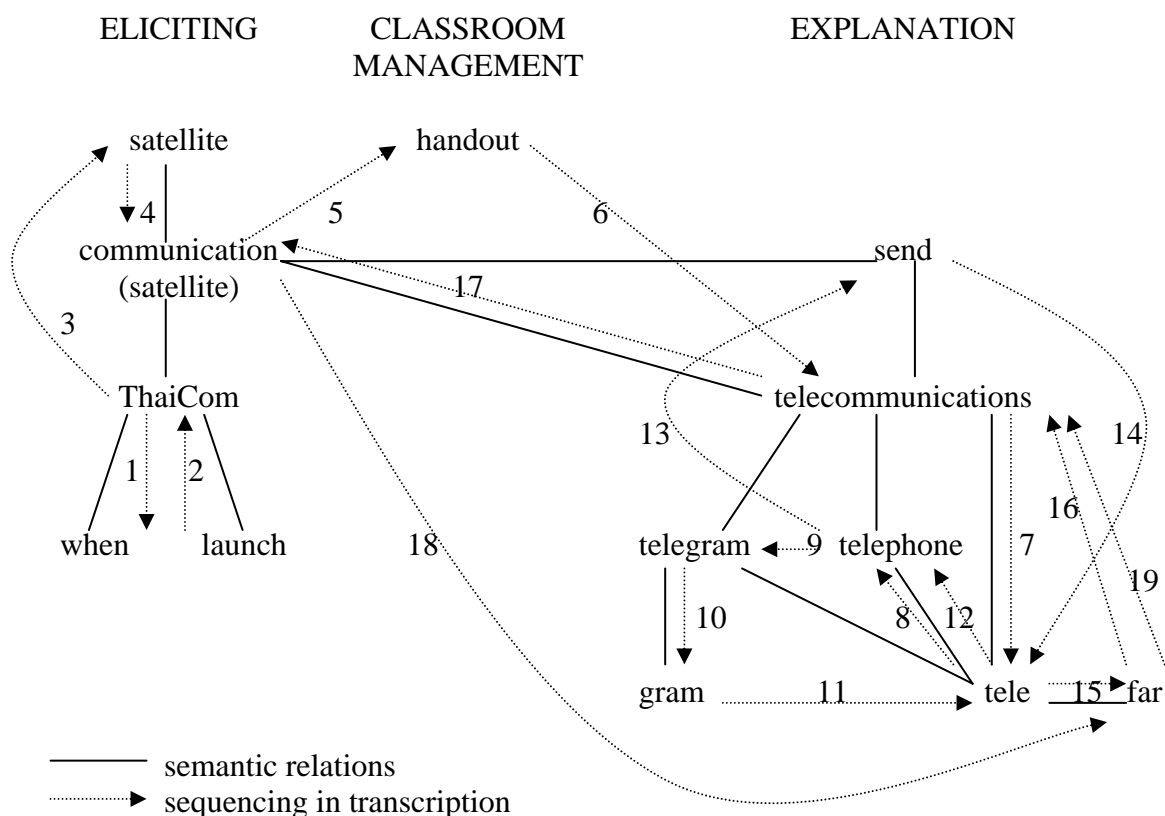


Figure 4 Line diagram of the transcription showing semantic relations and sequencing

## DISCUSSION

From the analysis above, we can draw several conclusions about the nature of the pedagogic discourse in the extract. Firstly, comparing the sections on eliciting and explanation, it is far easier to follow the sequencing of keywords in the eliciting section of Figure 4 than in the explanation section which follows a somewhat convoluted pattern. The ratio of topic movements to sentences for the eliciting section (4 movements in 23 sentences) is much lower than for the explanation section (13 movements in 29 sentences), due largely to the very high frequency of parallel progression in sentences 1 to 23. This difference between the eliciting and the explanation sections may affect the learners' comprehension of the discourse, although this point requires further research.

A second point concerns the distance in semantic space between consecutive keywords. I will give the distance between a keyword and its immediate hyponym or superordinate a value of 1. Similarly, the distance between two hyponyms of the same superordinate could also be assigned a value of 1. Thus in Figure 4 movements 1 and 2 would each have a value of 1 and movement 3 a value of 2 since it involves two immediate superordinates. Movement 5, on the other hand, has an indeterminate but large value signifying a change in topic which is also indicated by the teacher's use of a metadiscoursal marker. By determining values in this way, those movements which do not involve metadiscoursal markers have a value of 2 or less, except for movements 14 and 18. The limited distance in semantic space suggested by these low

values may make it easier for the learners to follow the progression between keywords and thus the development of topics in continuous discourse.

Thirdly, looking at the topic development through the discourse, those parts of the discourse which are bounded by metadiscoursal markers and thus exhibit topic insertion concern functions which are particularly managerial in nature. Sentence 20 is explicit teacher feedback (Cole and Chan, 1987), and sentences 24 to 26 are classroom management. These sentences do not directly contribute to the content of the lesson, but rather help the teaching-learning process to flow more smoothly.

The findings and conclusions have some implications for the language teacher. To begin with, metadiscoursal markers, the importance of which has already been highlighted from a functional perspective by Sinclair and Brazil (1982), are also crucial in indicating changes in topic within classroom discourse. Although most teachers appear to use these markers without thinking, their probable importance in helping learners follow the development of topics in classroom discourse suggests that teachers should pay special attention to their use of such markers.

A further implication for the teacher concerns the sequencing of keywords through the discourse. In teacher training and in the literature (e.g. Cole and Chan, 1987; Jantz, 1989; Kennedy, 1996; Watson Todd, 1997a), teachers are frequently reminded of the need for clear sequencing and logic in classroom discourse. However, the training and literature do not go on to explain what such clear sequencing and logic involves and how it can be achieved. The findings in this paper suggest that clearly sequenced classroom discourse would involve a reasonable ratio of topic movements to sentences, a fairly straightforward sequencing of keywords (such as that in the eliciting section of Figure 4 rather than the convoluted pattern in the explanation section), the use of metadiscoursal markers to indicate discontinuous discourse, and movements between keywords which are limited in semantic space.

## CONCLUSION

This article has focused on the content of classroom discourse by trying to identify the topics and follow their development through the discourse. The analysis has highlighted several characteristics of classroom discourse not immediately apparent from simply reading the transcription. Although the analysis is somewhat complex and needs further refinement, it provides a tool which teachers could use to analyse and understand their own teaching better and which could be applicable to other kinds of discourse. Since the analysis presented here is founded in a perspective not normally considered in classroom discourse analysis, conducting further analyses may provide more useful insights and possibly generalisable rules of topic organisation in classroom discourse.

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