

## ***Lexical Chains or Semantic Networks as Effective Top-down Pre-reading Activities***

**Parviz Ajideh**

*Tabriz University-Iran*

In order to interact efficiently with the text, the second language reader needs access to content as well as context. In other words, the second language readers will need to draw on appropriate schematic knowledge to reach satisfactory interpretation of the text. In fact schematic knowledge has textual representations which are represented by lexical choices made by the discourse producer in the encoding process. Thus, one of the teacher's duties is to help the reader recognize those lexical choices. Any lexical element in a text is the textual representation of an abstract mental concept. This study, conducted in Tabriz University, examines the effectiveness of lexical chains and semantic networks as a top-down pre-reading activity. It is suggested that prior to reading the instructor can highlight those lexical elements in a text that seem to be in close relationship with the topic of text and by making them transparent, the relevant schemata can be activated in the reader's mind.

**Key words:** lexical chain, coherence, semantic network, schema theory, reading comprehension, pre-reading activity

### **INTRODUCTION**

#### **Statement of the Problem**

As a university ESL reading teacher I have found that some students seem

to have no problem with understanding both words and sentence structures of the paragraph, but they can not reach satisfactory interpretation of the text. In fact, most ESL students rely too much on bottom-up processing individual words and analyzing sentence structures, but do not apply top-down processing for the overall view of the text. This may result from the lack of appropriate instruction and practice in applying reading strategies.

In brief, there are two main outlooks on reading. The first assumes that meaning exists in the text itself and it is the text-based factors that determine meaning, whereas, for the second view meaning is the product of the readers interacting with the text and it is inside-the-head factors that determine the meaning

In the traditional approach to reading, the students follow only bottom-up processes to comprehend the text. In other words, top-down processing strategies are not applied in such reading courses and the students are not familiar with such strategies. Nowadays, it is generally accepted that top – down processes not only facilitate reading comprehension but also motivate students to read the texts enthusiastically.

Despite the acceptance of the importance of schema theory and top-down approach in ESL reading comprehension, the schema theory-based-pre-reading tasks in enhancing ESL readers' comprehension are not favored by most of the ESL reading teachers. It is evident that schema theory based approaches to reading necessarily requires special pre-reading tasks quite different from those employed in traditional approaches to reading. Accordingly, in this study the effectiveness of lexical chains or semantic network as schema theory based pre-reading activities will be examined.

## **A Brief Review of the Related Literature**

### *Lexical Cohesion and Texture*

What distinguishes a text from a non-text is texture. In any language, a discourse producer has some resources to create texture in a text. Choice of

lexical items of various types contributes to the texture of a text. Some of these text-forming devices are overt and some others are covert. Regarding lexical cohesion, a writer creates semantic or lexical chains in a text and each chain consists of nodes that act as building blocks of this chain. The role of these nodes in a text is to activate the relevant schemata in the readers mind. The idea is, as Cook (1989, p. 69) points out, stimulated by key words or phrases in the text or by the context. It activates a knowledge schema, and uses it to make sense of discourse.

For Yule (1985) the key to the concept of coherence is not something which exists in the language, but something which exists in people. It is people who make sense of what they read and hear. They try to arrive at an interpretation which is in line with their experience of the world. Indeed, our ability to make sense of what we read is probably only a small part of the general ability we have to make sense of what we perceive or experience in the world.

Van Dijk (1983) points out that during comprehension, readers pull out from their general store of knowledge some particular packet of knowledge and use it to provide a framework for the text they are reading. That is, they use information from semantic memory to organize the text they read in order to perform a new episodic trace. However, schemata not only provide a coherent framework for semantic units of a text, they also provide a basis for a more active, top-down process.

#### *Lexical Cohesion and Reading Comprehension*

The implication of this textual analysis to reading comprehension is that the discourse producer in the process of encoding his message provides the decoder of various stages with sign-points to guide him towards the main theme of discourse. The responsibility of the reader is to be sensitive to such sign-points and recognize their relationship to create lexical chains that contribute to the development of the conveyance of writer's intended message(s) and the reader's recovering of message conveyed.

There had been hot debates among reading pedagogists on reading strategies employed by the reader in the decoding process. Some argue for bottom-up processing at a micro-level, that is to say the reader of a text moves step-by-step from small textual elements to larger ones, whereas some others believe that comprehension occurs at a macro-level, that is, the reader moves from larger textual and organizational elements to smaller ones.

The interactive processing model proposed by Stanovich (1980) seems to have settled this debate. According to McGarthy (1991) advocating top-down strategy does not mean neglecting the role of individual words, phrases, and grammatical devices in guiding the reader around the text.

Brown and Yule (1983) state that it is the predictive power of top-down processing that enables the human reader to encounter, via his bottom-up processing, ungrammatical or miss-spelt elements in the text and to determine what was the most likely intended message.

#### *Pre-reading Activities*

One way of facilitating a reader's interaction with a text and providing orientation to context and content is through various kinds of text-related tasks. The idea that there are three main types of reading activity, those which precede presentation of the text (which is the concern of this study), those which accompany it, and those which follow it, is now a common feature of discourse about reading (Wallace, 1988; Williams, 1984). Most contemporary reading materials reflect these strategies, though in rather different ways.

Some pre-reading activities simply consist of questions to which the reader is required to find answers from the text. Traditionally, this type of question followed the text and was designed to test comprehension, but in more recent materials questions often precede the text and function as scanning prompts. That is, the learner reads the text quickly in order to find specific information related to the questions.

Other pre-reading tasks have tended to focus exclusively on preparing the reader for likely linguistic difficulties in a text; more recently attention has

shifted to cultural or conceptual difficulties. However, pre-reading, activities may not just offer compensation for second language reader's supposed linguistic or socio-cultural inadequacies; they may also remind readers of what they do already know and think, that is to activate existing schematic knowledge.

Carrell and Floyd (1987) maintain that the ESL teacher must provide the student with appropriate schemata s/he is lacking, and must also teach the student how to build bridges between existing knowledge and new knowledge. Accordingly, a number of organized pre-reading approaches and methods have been proposed in the literature for facilitating reading through activation of background knowledge.

In this connection Ajideh (2003) suggests schema theory based pre-reading activities in providing the learners with appropriate schemata they are lacking.

It was also claimed that pre-reading vocabulary exercises, despite widespread use, did not improve overall comprehension (Hudson, 1982; Johnson, 1982). According to Johnson, vocabulary study might result in a word-by-word, bottom-up approach that was detrimental to comprehension. But direct vocabulary instruction did not necessarily involve teaching specific words rather equipping learners with strategies necessary to expand their vocabulary. It was also argued that most vocabulary was learned through context, but that the learning-from-context method was at its best for teaching learning-to-learn skills not for teaching vocabulary (Oxford & Scarcella, 1994).

Many teaching techniques have been developed to activate student's prior knowledge for effective top-down processing in order to facilitate reading comprehension. Several of them have been empirically proven to be helpful, but some have not (Chia, 2000). In fact, vocabulary study may result in a word-by-word, bottom-up approach that is detrimental to comprehension. But direct vocabulary instruction does not necessarily involve teaching specific words rather than equipping learners with strategies necessary to expand their vocabulary. It is also argued that most vocabulary is learned through context, but that the learning-from-context method is at its best for teaching learning-

to-learn skills not for teaching vocabulary (Oxford & Scarcella, 1994). Pre-teaching vocabulary probably requires that the words to be taught in semantically and topically related sets so that word meaning and background knowledge improve concurrently.

### **The Concept of Semantic Network**

According to Carroll (1999), the manner in which we store information is related to the ease of retrieval. Consider a single example. Suppose we stored every word we learned, in the order in which we learned them, in a long list. If asked, we could fairly easily determine which word was learned at an earlier age by noting the relative position of the words on the list. On the other hand, it would be relatively more difficult to determine whether a given word has a synonym, for the synonym might appear anywhere on the list. This form of organization is not as silly as it sounds, previous research indicates that the time when we acquire words is related to their ease of access. But the point for now is simply that the organization of the lexicon influences ease of retrieval.

The main idea regarding the organization of the lexicon is that it is set up as a network of interconnected elements. The elements are concepts or nodes, which are connected to one another by virtue of having various relations with one another. We know a large number of words are related to one another in a large number of ways, and it appears that a network might be an appealing way to capture this fact.

One of the most popular models is the Teachable Language Comprehender (TLC) by Collins and Quillian (1969) as cited in Mayer (1992). Their goal was to devise a program that stimulates how people answer questions. The units represent one subject or thing. The properties are words that represent characteristics, and the pointers are the relationships among the units and properties. (Mayer, 1992)

After testing this model for recall time in a study by Collins and Quillian (1969) it was determined that the more the levels the longer the response time

to recall the answers to the questions; for example, when asked (a canary can sing) or (a canary can fly), less response time was recorded on (a canary can sing). There were no levels to jump therefore the response time was less.

The hierarchical characteristic of this model also has implications for recall. An experiment designed to study the effects of organizational tasks on recall showed that having words organized in a hierarchical fashion promoted a greater recall of the words than when they were in a random fashion. Even after four attempts the group with the random listing recalled fewer words than the organized group on their first attempt (Reed, 2000).

The feature model of semantic memory indicates that information is not stored in networks at all but as a list of subsets or features. This model focuses more on the semantic distance of relationships between words. An example is (dog is an animal) or (dog is a mammal). The response time for recall is greater for dog is mammal because of the semantic distance between the terms. Semantic distance is how many features the two terms have in common (Guy, 2000).

In the feature comparison model, each concept has a list of defining features that are crucial to the meaning of the concept. When recalling information, learners find the list features and compare them. If they are very different then there are no relationships.

Spreading activating model takes into consideration some aspects of both the Network model as well as the Feature Model. It emphasizes links between terms as in the network model and show relationships between subjects as in the feature model.

These semantic network representations all have differing ways of representing knowledge by emphasizing how two nodes might relate. After learning some types of models, we now have the foundation to ask ourselves, “what are the benefits in using and learning about semantic networks?”

Semantic networks are important because they attempt to put some organization of thoughts and learning. According to Jonassen (1993) understanding the structural foundations of any content domain improves comprehension and structural knowledge is essential to recall and

comprehension because research has shown that knowledge is facilitated by organization.

### **Semantic Network and Schema Theory**

Semantic network provides a way of organizing knowledge and of showing how two terms of concepts are related. But it does not show how larger clusters of knowledge are grouped together. Schema theory is a fully developed theory that illustrates clusters of knowledge representing a procedure, object, event, sequence of events, or social situation. It describes a collection of models that depicts and stores our experiences.

According to Jonassen (1993), semantic networks are concept maps that describe a person's cognitive structure—the ideas (schemas) and their complex interrelationships (schemata) in memory that provide meaning to the language used to transmit those ideas. Schemas are arranged in networks (schemata) of interrelated concepts. These networks are known as our semantic network.

Since the various components of a schema are arranged in a network of interrelated concepts, and since words are actually labels for concepts (Johnson & Pearson, 1984), we can assume that words too are stored in semantically related networks. Cornu (1979) for example, reports that research has shown that individuals tend to recall words according to the semantic fields in which they are conceptually mapped. Henning (1973) also finds that advanced students remember words that are stored in semantic clusters, while low-proficiency learners tend to recall words on the basis of their sounds (i.e., in acoustic clusters). Stanovich (1981) refines the idea through his concept of spreading activation in which semantically related forms arranged in a network are activated or made available automatically. In other words, good readers “store” their knowledge of vocabulary in semantically related networks. The activation of a word in a network will automatically “activate” other related words, which will then aid comprehension.

## **METHODOLOGY**

In line with the findings of studies that have been done in the area, this study was conducted to deal with the effectiveness of lexical and semantic networks

### **Research Questions**

The present study is an attempt to find appropriate and justifiable responses to the following questions:

1. Is there any significant difference between the effects of vocabulary and lexical chains as pre-reading activities?
2. Are lexical chains or semantic networks as pre-reading activities effective than vocabulary ones?

### **Subjects**

This study was conducted with intermediate level EFL students in Tabriz University. 60 students were selected as the subjects for this study. The subjects were assigned into two groups: 30 for experimental group and 30 for control group and then the following steps were taken into consideration.

### **Materials**

The materials for pre-tests and post-test were selected from Michigan Tests of English Proficiency. The reading materials for teaching during the term were selected from different sources appropriate for intermediate level. Two important points had been taken into consideration in this regard. (a) There was an attempt to select materials on general topics. (b) Authentic materials were more favored than simplified ones.

## **Procedure**

At the very beginning of the term, a pre-test consisting of four standard reading comprehension (Selected from reading sections of Michigan Tests), was administered to both the experimental and the control groups. No significant difference was found between the two groups of scores at the very beginning of this project

Both of the control and experimental groups were exposed to reading comprehension for one academic term.

Teaching lexical chains as a pre-reading activity was the main strategy applied to the experimental group, while, teaching vocabulary in a traditional way was the main concern for the control group.

What follows are some top-down activities applied to experimental group. These activities are in consistent with the idea of lexical chain or semantic network.

### Activity 1. Word prediction (type 1)

The teacher writes a topic (for example, “pollution”) on the board, and students predict the words that would be associated with the topic. Using this as a pre-reading activity, the teacher tells the students that they are going to read a passage on, say, “Pollution” and the students are to predict the words that may appear in the passage. The teacher writes the words on the board, occasionally asking the students the reason for their choice of words or for the meaning. Students then compare their words in pairs or as a class, explaining or defending their choice of words. An important element is that students should be encouraged to explain why they have predicted the words.

As a variation, students can be given the title or topic of a reading text and an accompanying list of words. The students then go through the list in pairs or as a class, predicting whether each word would appear in the reading text, giving reasons for their choice. An example is given below:

You are going to read a passage. Before reading it, decide which of the

following words you would expect to find in the passage. Compare your list with your partner's, giving reasons for your choice.

Materials	Shelter
hostile climate	shape
heat	war
dwelling	warm
cold	igloos
drugs	cool
Interior	exterior
Breezes	positioning
Kill	structure
Comfort	humid
	pollutes

This activity, besides its value as a pre-reading activity in activating background knowledge and arousing curiosity, also provides opportunity for purposeful discussions of the words.

#### Activity 2. Word Prediction (type 2)

This activity can be regarded as a variation of the first one. The teacher writes down some key words related to a topic and the students are asked to predict the topic. Students are asked, for example, to predict the topic from the following words:

Sky	colors
Curved	rain
Sight	people
Wander	sight
Colors	shines
Water	light
Sun	reflects

After the students have predicted the topic, they can be asked to predict

other words related to it. Being used as a pre-reading activity, this helps to activate existing words in the students' schema, thereby reinforcing existing semantic networks and facilitating automatic lexical access. Personal experience also shows that students very naturally refer to the dictionary or consult their peers for the meanings of unfamiliar words.

#### Activity 3. Selection-critical words

Following Johnson and Pearson (1984), I found this activity more effective in activating background knowledge and enhancing comprehension. I asked the students to focus on some critical or keywords in the text. To my experience, I found that focusing on critical words motivate the students to follow the reading enthusiastically. This activity proved to be more useful strategy even in dealing with passages or texts without topics. For the students were mostly successful in finding a core word and critical words related to it.

As a more favored version of this activity, I gave a passage to the students to skim it for a few minutes and write at least ten words that seem as the key or critical in the passage. Some students were expected to write their selected words on the board. Fortunately, some words were commonly used, and the students' comments which had created a fresh atmosphere in reading class could help to come on an agreement on other key words. This activity could be followed in groups and their representatives take part in selecting the key words and giving comments.

#### Activity 4. Working with Key words

As a pre-reading activity I wrote some key words of the passage on the board and then asked the students to write a paragraph by using them. Although this activity might be regarded as an appropriate one for enhancing writing, I found it more helpful in activating students' background knowledge and enhancing their reading comprehension.

At the end of the term, a post-test consisting of four standard reading comprehension (Selected from reading sections of Michigan Tests) was administered to the both the experimental and the control groups.

## Results and Discussions

Addressing each question the obtained results will be interpreted and discussed:

### *Research Question No.1*

Is there any significant difference between the effects of vocabulary and semantic networks as pre-reading activities?

**TABLE 2**  
**Means, Standard Deviations, and T-value for the Students' Scores in Post-test**

Group	No. of cases	Mean	SD	t-Value
Experimental group	30	15.6	2.28	
Control group	30	14.1	2.48	2.45

At significance level of .05 Our t- value is enough above t- critical. Our two groups have scored differently on the final test of reading comprehension and the difference is statistically significant. This is a support for our claim that there is a significant difference between the effects of vocabulary and semantic network as pre-reading activities in promoting SLA students reading comprehension.

### *Research Question No.2*

Are semantic networks as pre-reading activities effective than vocabulary ones?

**TABLE 3**  
**T-values for Matched t-tests**

Group	No. of cases	t-Value
Experimental group	30	12.7
Control group	30	5.50

Table 3 indicates that matched t-test applied to control group scores denotes the t-value of 5.50, while the matched t-test applied to experimental group scores shows t-value of 12.7. Obviously, t- value for experimental group is high above the t-value for control group. This means that our instruction has been more effective for experimental group that is due to the effectiveness of semantic networks as pre-reading activities.

Lexical chain or semantic network incorporates many of the aspects of Communicative Language Teaching which have been found to benefit students in learning a second language:

1. Semantic network is an interactive pre-reading activity, because students work with each other before the targeted language topic. Its creation entails total students involvement; the students are active participants throughout the development of the map. Their brain storming allows the map to take its first shape; and their output during and following the assignment determines the final shape the map will have.
2. It is a predictive activity because in the pre-reading phase, the students' discussion basically anticipates what will appear in the reading material. Being allowed to make brainstorming and categorizing predictions about the reading whets the students' appetite to read. They want to know if their suggestions anticipated those of the writer of the reading passage.
3. It is student centered because the semantic map makes use of the students' prior knowledge and because students control the input at each stage of the map's building.

4. Finally, it is an integrative activity, since it allows students to connect previous knowledge with knowledge, thereby expanding their reservoir of knowledge through that relationship.

In sum, semantic network can become an effective pre-reading technique in ESL reading classroom, and a map, like a picture, can be worth a thousand words.

## THE AUTHOR

*Parviz Ajideh* is assistant professor in the Dept. of English of Tabriz University in Islamic Republic of Iran. His current research interests cover reading comprehension, Testing and ESP. His recent publications include *Schema-theory Based Considerations on Pre-reading Activities in ESP Textbooks* in Asian EFL Journal: English Language Teaching and Research Articles (2006).

Email: parviz\_333@yahoo.com

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