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RESEARCH ARTICLE

SCHEMA THEORY: HOW IS IT ACTIVATED IN IRANIANL1READERS?

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ABSTRACT

Reading comprehension research within the framework of schema theoretical view has shown that the ability to understand texts is based not only on the reader's linguistic knowledge, but also on his/her general knowledge of the world (schemeta) and the extent to which that knowledge is activated during the actual process of reading (Carrell, 1983a; 1983b; Carrell and Wallace 1983; Carrell and Eisterhold, 1983). But few empirical data are available about the processes by which schemata are evoked (Carrell, 1987). This study is an attempt to see how much of the schema is activated. An experiment was designed to investigate to see the 'how' of schema activation, to see whether the relevant part of the schema or the whole schema is activated. Sixty first semester students (30 males and 30 females) majoring English in Isfahan Teacher Training Centers(Teachers'University), participated in the experiment. The subjects were first asked to read a list of ten sentences(Read list) about the kitchen in their native language (Farsi).To forget what they had already read, they were given some math problems. Then, they were asked to search in the 'Test list' and check the ten sentences of the 'Read list' in it. The 'Test list' consisted of the ten sentences in the 'Read list' and other sentences not existing in the 'Read list ' concerning both the kitchen or the other parts of the house. The mistakes the subjects made in checking the ten sentences were of two kinds: Relevant (about the kitchen but not existing in the Read list) and irrelevant (about the other parts of the house). The results of t-value computation indicate that most subjects activated the relevant part of the schema (the kitchen). No significant difference was found between males and females in this regard, though the male subjects had proportionally more relevant mistakes.

INTRODUCTION

Schema theory as the term is used today refers to the role of background knowledge in reading comprehension. It can be considered as an information-processing model of the mind in which knowledge is stored in related units that can be recalled and activated to operateon incoming information (**Anderson, 1984**). Within this framework, **Perkins (1983)** refers to a process of 'semantic constructivity ' that readers use to create meaning from a written or spoken text. **Cook (1989)** states, "the mind, stimulated by key words or phrases in the text or by the context, activates a knowledge schema" (**Cited in Huang Quian,2009**). This implicitly indicates that one's linguistic knowledge alone is not enough in determining text comprehension. Rather as **Anderson *et al.* (1977)** point out," every act of comprehension involves one's knowledge of the world as well "(369). The concept of schemawas first used by the psychologist F.C Bartlett (1932) to explain how the knowledge that we have about the world is organized into interrelated patterns based on our previous knowledge experience.

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Anderson (1980) defines schemata as "large, complex units of knowledge that organize much of what we know about general categories of objects, classes of events and types of people"(129). In this view, the brain performs two functions: First, it receives and organizes information and then assembles it into organized and interrelated units available for immediate retrieval. **Widdowson (1983)** refers to schemata as "cognitive constructs which allow for the organization of information in long-term memory which provide a basis for prediction". In addition to schemata, other terminologies such as plans, frames, scenarios and scripts are used for the representation of background knowledge in the production and understanding of discourse and subsequent to the mid 1970s, the above related notions have been emphasized in cognitive science (**Chafe, 1976; Filmore, 1975,1985; Rumelhart, 1975; Schank and Abelson,1975**).

Schema and Reading Comprehension

Reading comprehension within the framework of schema-theoretical view is an interactive process between the reader and the text (**Carrell, 1983a; 1983b; Carrell and Wallace 1983; Carrell and Eisterhold, 1983**). Thus, readers develop a coherent interpretation of text through the interactive process

of "combining textual information with the information a reader brings to a text" (**Widdowson in Grabe 1983**). In this view, the interaction between knowledge already stored in memory and the new information is referred to as comprehension. In other words, as **Adams and Bruce (1982)** contend, "comprehension is the use of prior knowledge to create new knowledge". To understand the role of schema in comprehending texts, it will be more beneficial to point to different types of schemata, that is 'formal' 'content' and' general world knowledge schemata.

Formal Schema

Readers are said to possess formal schema, that is background knowledge of the formal, rhetorical organizational structures of different types of texts (**Carrell and Eisterhold, 1983**). In other words, readers are assumed to posses background knowledge about differences among rhetorical structures of different texts, such as fables, simple stories, scientific texts, newspaper articles, poetry and so forth (Ibid. 79). Readers are also assumed to posses different expectations of each of these genres. For example, they expect a story to have a setting, a beginning, a development and an ending (opcit :79)

Content Schema

Content schema refers to knowledge of topics and concepts for reading in particular subject areas such as history, physics, biology…etc. Teachers often assist students in developing the knowledge required for understanding the technical and specialized vocabulary of their fields of study. Numerous studies have reported the average correlation between a person's background knowledge of a given topic and the extent to which that person learns information on that topic (**Nagy *et al.*,1987; Tamir, 1988**). Research by Johnson (in **Carrell and Eisterhold, 1983**) suggested that a text on a familiar topic is better recalled than a similar text on an unfamiliar topic.Thus, when content and form are familiar, the text will be relatively accessible (**Swales, 1990**).

General World Knowledge Schema

The third type of schema, general world knowledge schema, Concerning with understanding social relationships, activities and causes that are relevant to many specific situations or cultures. It enables us as readers to engage in appropriate inferences while reading and to relate with persons and situations. Studies by **Steffensen *et al.* (1979); Johnson (1981); and Carrell (1981)** have all shown that the implicit cultural knowledge presupposed by a text and the reader's own cultural knowledge interact to make texts based on one's own culture easier to read and understand than syntactically and rhetorically equivalent texts based on a less familiar culture (**Carrell, 1987 cited in Carrell *et al.*, 1988**). **AsCarrell and Eisterhold (1983)** point out " one of the most obvious reasons why a particular content schema may fail to exist for a reader is that schema is culturally specific and is not part of a particular reader's cultural background".

The present Study

Recent studies in second and foreign language reading indicate that the best predictors of comprehension are reader factors. That is, the topic of a text and the extent to which readers have knowledge of that topic appears to be a much more powerful force in text understanding than text-based factors (**Allen, D.E. *et al.*, 1988**). In this view, the topic of a text appears to activate the relevant schema. But as (**Carrell 1987 in Carrell 1988**) argues the processes by which schemata are evoked are not well understood. The purpose of the present study was to examine schema activation to see how much of the schema is activated if the conditions that hinder adequate comprehension, that is absence of relevant schema, failure in schema activation, skill deficiencies …….etc. are controlled. In other words, this paper investigates whether the whole schema or the relevant part of the schema is activated. If, for example, one reads some sentences about the wheels of the car, does he/she activate the whole schema (the car) or the relevant part of the schema (the wheels) ? Or if one reads a set of sentences about the kitchen (which is a subschema of the house schema) does he/she activate the kitchen that is the relevant-to-topic schema, or the whole schema, the house?

METHODS

Subjects

Sixty subjects, 30 males and 30 females, aged 19 to 25 participated in the study. They were chosen from among students majoring English in Isfahan teacher training centers. They were all Farsi native speakers and were all naïve with respect to the purpose of the study. They were tested in group. Thirty two subjects of the two groups (male and female) were excluded from the study. Twenty five of the them had no mistakes and the rest (seven subjects) did not exactly follow the instructions. Therefore, from among sixty subjects participated in the study only twenty eight who had completed the Test list were carefully chosen and equally distributed in the two male and female groups (14 each).

MATERIALS

Two lists of sentences were constructed, Read list and Test list. The Read list consisted of ten sentences about one part of the house (here the kitchen). The Test list consisted of twenty three sentences about different parts of the house including the ten sentences in the Read list, sentences about bedroom, the hall, the yard,……etc., and also other sentences about the kitchen not existing in the Read list. The sentences in the Test list were randomly ordered. In both lists the sentences were all in the native language of the subjects (Farsi).

Procedure

The study included two Tasks: Read task and Test task. The subjects were told that they had to read a list of sentences (Read list), all appearing on a piece of paper. When they finished reading, they were given a distracting activity (e.g. they were asked some math problems). The purpose of the activity was to help them forget what they had already read. After that, the subjects were asked to search in the Test list and check the sentences they had read in the Read list. Thirty seconds were allotted for the Read task, seven minutes for distracting activity and sixty seconds for the Test task. The allotted times were determined according to the pilot study.

RESULTS AND DISCUSSION

The Test list of the subjects were studied and scored. Each subject had two scores, one for his/her relevant mistakes and one for his/her irrelevant ones. For example, if one had three mistakes, one relevant and two irrelevant, she/he was scored 1 under the column of relevant and 2 under the column of irrelevant. Or if one had only two relevant mistakes, she/he was scored 2 under the column of relevant and 0 (zero) under the column of irrelevant. So each subject had two scores, one under the column of relevant and another one under the column of irrelevant. Table 1 shows the scores obtained by the subjects (male and female) and the mean values of the scores.

Table 1. The scores of each Subject

Relevant	Irrelevant
2	0
1	0
1	0
1	0
1	0
1	0
1	0
1	0
1	0
1	0
1	0
0	1
0	1
2	1

Relevant	Irrelevant
0	1
0	1
0	1
1	1
1	2
1	1
1	0
2	0
2	0
3	0
1	0
1	0
1	0
1	0

SX_1=29 SX_2=10
N1=28 N2=28
X1=1.03 X2=0.35

In order to study the significance of the difference between the two means, the data was submitted to t-test, the results of which are shown in Table 2 below. To check to see whether this obtained 't' (4.04) is statistically significant or not , the t-table was checked. In this study there were 56 subjects in the two groups (in fact 28 subjects but each had two scores for relevant and irrelevant mistakes). This gives a total of 54 d.f (N1+N2 -2). The d.f (54) falls somewhere between 50 and 60.To be more conservative, the experimenter chose 50 and selected the .05 and .01 levels of significance for rejecting the null hypothesis.The t- values of the table across the levels .05 and .01 are 2.01 and 2.68 respectively. In contrast, the obtained 't' is high enough that we can safely accept its significance. The t-value supports that subjects mostly activated the relevant schema (the kitchen).

Table 2. The results of t.value computation

	N	Mean	t.value	d.f	t-table Level:.05	t-table Level:.01
Relevant	28	1.03				
Irrelevant	28	0.35	4.04	54	2.01	2.68

To compare the male and female's activation of schema, the means of the scores for relevant mistakes of male and female subjects were computed. And, they were 1.07 and 1 respectively. The results of t-value computation are shown in Table 3 below. The results show that the obtained t-value (0.26) is below the t-value of the table across the levels .05 and .01. So we are not quite safe in rejecting the null hypothesis below:

There is no significant difference between male and female subjects in activating the relevant schema

Therefore,there is no significant difference between male and female subjects in this regard. The results of the study and the analysis of those results presented in Tables 2 and 3 above, suggest some explanations. The first explanation focuses on the relevancy of mistakes to the topic. That is, the results show that both male and female subjects had more relevant mistakes which indicate that they had activated the relevant part of the schema. The second explanation centers on the difference between male and female subjects.

Table 3. The results of t.valuecomputation(difference between male and female subjects)

	N	Mean	t.value	d.f	t-table Level:.05	t-table Level:.01
Relevant	14	1.07				
Irrelevant	14	1	.26	26	2.06	2.78

The results of t-value computation (Table 3) indicate no significant difference between male and female subjects in this regard. The results of this study is consistent with the principles of the schema activation suggesting that to comprehend a text, a reader's background knowledge or schemata must interactwith the text. The subjects in this study checked sentences not existed and read in the Read list but were relevant to the topic of the Read list (the kitchen). In my conjecture that is schema which directs the subjects to be relevant to the topic.

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