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Original Paper

On Effects of Signaling on Recall

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Abstract

All the information that explicitly indicates how a discourse is structured is called signaling; this information is supposed to be helpful, for example, for readers to comprehend a passage by enabling them to identify how it is structured. This study examines how Japanese college students respond to a passage with signaling and one without signaling. Their recall scores did not show any significant difference between the too groups. Signaling did not work properly as expected not because signaling is not helpful information, but because the subjects did not have enough knowledge of English discourse structure.

Introduction

Reading is not identifying letters or words, nor decoding each sentence. Reading is comprehending what the writer wants to say. Simply adding the meanings of single sentences is not enough to comprehend what the writer wants to say. By identifying the discourse structure of the text, we can comprehend clearly and easily what the writer wants to say: what its topic is, what its main point is, what reasoning the writer uses, and so on. And what is conspicuously lacking in the minds of teachers teaching English as a foreign language to Japanese students is the need to teach any information on English discourse structure.

Meyer & Freedle (1984) divided expository passages into four types of discourse structures and examined how readers identify each type and what effects the successful or unsuccessful identification have on the recall protocols of the passages[1]. As Meyer (1975) defines it, signaling points out aspects of the structure of the content of a piece of prose[2] or signaling is any statement that signals the structural changes of the discourse contents.

In this paper, it is examined how Japanese college students respond to signaling by analyzing their recall protocols, what factors influence the successful or unsuccessful identification of the discourse structure, and what implications can be obtained to enable Japanese college students to comprehend

English passages in the sense defined above.

Method

Thirty-six sophomores of Kawasaki University of Medical Welfare (none of them English majors) were tested at the end of their one-year English course. They had not been taught how English discourses are structured in their regular English classes. They were divided into two groups: one group was to read a passage with signaling (signaling group, n=19) and the other was to read a passage without signaling (non-signaling group, n=17).

Materials

The materials the subjects were told to read are two versions of a short English passage with the structure of problem-solution: one with signaling (103 words) and the other without signaling (94 words) (see Appendix A). This passage is a shortened version of the passage originally used in Meyer et al (1980)[3]. The topic of the passage is how to prevent oil from spilling from supertankers, the background knowledge of which none of the subjects seemed to have. The words the meanings of which the writer thought the subjects would not know or might be uncertain of were given their meanings in Japanese on the same sheet with the passage.

Procedures

All the subjects were given an English proficiency test comprising three sections (grammar, vocabulary, and reading comprehension) a week before the recall test[4]. Immediately after reading the passage for three and a half minutes, the subjects were told to spend five minutes writing in Japanese anything they could remember from their reading.

Scoring

Each version of the passage was divided into idea units (roughly equivalent to clauses): 14 units for the signaling version and 11 for the non-signaling version. Each translation of idea units was scored and given three points when it contained all the information of the original idea unit, two points when it contained more than half of the information, and one point when it contained less than half of the information. No point was given when a recall protocal contained no correct translations. The degree of how much each subject succeeded in identifying the correct discourse structure (structure score) was measured according to the criteria (1-10 scale) originally given by Meyer et. al (1980). But some terms of the criteria were changed because in the original criteria only explicit statements of signaling in the protocol were highly evaluated. On the other hand, because the non-signaling version had no explicit statements of the discourse structure in it, the original criteria unfairly underestimate the degree of successful identification on the part of a subject when he or she recognizes the correct discourse structure without giving any explicit statement of this structure. Especially when the subjects are not told that the object of the experiment is to measure how signaling influences their recalls, some change is rather necessary for a fair measurement. According to the revised criteria (see Appendix B), even without any explicit statement of discourse structure, a recall protocol was judged to show the correct identification of the discourse structure when the structure — a problem and a solution to the problem — was mentioned in the protocol and a subject answered that he or she had realized that the discourse had a problem/solution structure to a question given after writing his or her recall

protocol.

Results

The results of the English proficiency test given before this study showed no significant differences in the three categories (grammar, vocabulary, and reading comprehension) between the signaling group and the non-signaling group. The mean recall scores were 26.32(%) (sd=13.87) for the signaling group and 27.99 (sd=14.19) for the non-signaling group. The difference was not significant enough (t=0.347, n.s.). The mean scores measuring how much the subjects succeeded in identifying the correct discourse structure were 5 (sd=1.97) for the signaling group and 4.47 (sd=1.91) for the non-signaling group. The difference was not significant enough (t=0.09, n.s.).

To analyze which of the three categories, grammar, vocabulary and reading comprehension, is related most to the structure scores and the recall scores, correlations were calculated between each of the structure scores and the recall scores and each of the test scores of the three categories of the English proficiency test (Table 1).

Discussion

Using the 1-10 scale for the structure identification, Meyer et. al (1980) define that recall protocols with a grade above 6 are the ones in which the correct discouse structure are identified. Given the mean structure scores of 5 for the signaling group and 4.47 for the non-signaling group, what we could conclude is that the degree to which the subjects in the signaling group failed to identify the correct discourse structure was not significantly different from that of the subjects in the non-signaling group. In other words, the presence of the explicit information on the discourse structure did not help them identify the correct discourse structure of the passage significantly.

Recall scores are positively correlated both in L1 and L2 with the degree of how correctly readers recognize the discourse structure[5)6)7)]. In this study, as expected from the absence of any significant difference between the structure scores of the two groups, there was no significant difference between the recall scores of the two groups, either.

Then, why didn't signaling show any expected effects? What reading strategy, if any, did the subjects possess and utilize when they read the test passage and how different was that from the strategy possessed and utilized by readers who are helped by signaling? We can guess what strategy they used by examining correlations between the structure scores and recall scores on the one hand with the grammar scores, vocabulary score and reading comprehension scores of the English

Table 1 Correlations between the Structure Scores and Recall Scores and the Test Scores of the English Proficiency Test

		Grammar	Vocabulary	Comprehension
Signaling Group (n=19)	Structure	.1331*	−.39*	−.0867*
	Recall	.379***	−.00402*	.34***
Non-Signaling Group (n=17)	Structure	.208*	−.0044*	.0993*
	Recall	.409***	.116*	.315**

(***p<0.2, **p<0.3, *p<0.5)

proficiency test on the other.

Though all the correlations were rather low and their confidence coefficients were not at a significant level, the grammar scores have some degree of correlational relationship with the recall scores. Because the grammar questions given to them are on intra-sentential grammar rules, not on inter-sentential grammar rules, this could mean that the subjects of both groups still stuck to their old habit of translating single sentences and reading the passage as a list of sentences without any structure in it. The scores of reading comprehension of both groups, on the other hand, show almost no correlational relationship with the structure scores. To answer the reading comprehension questions correctly, what was needed was global information scattered beyond sentence boundaries rather than local information contained within sentence boundaries. This, again, shows that the subjects of both groups did read the test passage as a list of sentences with no structure in it, not as a structured discourse.

When readers read a passage as a list of sentences, signaling does not necessarily play its expected role. The readers do or do not notice what signaling signals. When they notice, they change their strategy and begin to read the same passage as a structured discourse. When they don't notice, however, they keep reading the passage as a list of sentences. Though no test was given to examine how much the subjects know about inter-sentential grammar rules or discourse structure, it would be a fair guess that they had no or very scant knowledge. Thus, they probably did not notice what signaling signals and failed to change their strategy of reading a passage as a list of sentences.

The scores of vocabulary did not show any correlational relationship with the structure scores and recall scores. The fact that most of the words which were expected to cause the subjects difficulty in understanding were annotated may explain this.

Conclusion

Because the English proficiency test given for this study comprised questions taken from a mock TOEFL test and had no listening comprehension questions, and the confidence coefficients of the correlational analyses were not at a significant level, the results of this study could not be conclusive. However, it would not be wrong to say that signaling, supposed to help readers identify the correct discourse structure of a passage, did not work properly in this study because the subjects did not have enough knowledge of English discourse structure. In other words, signaling failed to trigger the structure strategy, with which readers search for the correct discourse structure of the passage they are reading.

Further research will have to be done to know how much knowledge of English discourse structure is needed for signaling to exert an expected influence on readers. However, we do not have to wait for the results to begin to teach that a sentence is not the one and only thing that we sholud be concerned with and that sentences are coherently structured to make them as a whole meaningful. Besides being taught how an English sentence is made up, Japanese college students need to be taught how English sentences are coherently connected and make a meaningful whole; this may be expected to make signaling work properly.

Further research will also be needed to examine how it is possible for Japanese college student to apply to English passages the successful reading strategy they utilize when reading Japanese passages. In reading any

language, a successful reading strategy should be structure-dependent in that a passage is read as a structured meaningful whole, not as a list of sentences.

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Appendix A: Reading Passage

(Signaling Version)

A problem of vital concern is the prevention of oil spills from supertankers. A typical supertanker carries a half-million tons of oil and is the size of five football fields. A wrecked supertanker spills oil in the ocean; this oil kills animals, birds, and microscopic plant life. The solution to the problem is not to immediately halt the use of tankers on the ocean since about 80 percent of the world's oil supply is carried by supertankers. Instead, the solution lies in the training of officers of supertankers, better building of tankers, and installing ground control stations to guide tankers near shore. (The underlined words are signaling.)

(Non-signaling Version)

Prevention is needed of oil spills from supertankers. A typical supertanker carries a half-million tons of oil and is the size of five football fields. A wrecked supertanker spills oil in the ocean; this oil kills animals, birds, and microscopic plant life. An immediate halt of the use of tankers on the ocean is not possible since about 80 percent of the world's oil supply is carried by supertankers. Officers of supertankers must get top training. Tankers better than present one should be built. Ground control should be installed to guide tankers near shore.

Appendix B: Revised Criteria for Structure Scores

10 points: any recall protocol which has two sections, one with the words, "problem," and the other "solution", explicitly mentioned

9 points: any recall protocol which has two sections, one of them with the word, "problem" or "solution," explicitly mentioned

7 points: any recall protocol which has two sections with no explicit word, "problem" or "solution", but which the subject judged to have a problem/solution structure

5 points: any recall protocol which has two sections

3 points: any recall protocol which has any structure other than a collection of bits of the description and problem/solution

2 points: any recall protocol which has a collection of description structure

1 points: any recall protocol which has no structure with sentences listed unconnected