

A Computer Assisted Learning System for Developing Reading Strategies for Cohesion Comprehension

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Abstract

Cohesion, such as reference and substitution, is used to show how sentences, which are structurally independent of one another, may be linked together (Halliday and Hasan 1976) and is one of the components of coherence in reading texts. However, compared with studies on cohesion itself, there have been fewer studies made or textbooks written on teaching the comprehension of cohesion. One of the possible reasons for this is the limitations of usual textbooks and exercises. Since such textbooks and books of exercise cannot easily demonstrate how each cohesive tie is related, when they cannot establish coherence with cohesive ties in the individual study, readers are in trouble.

The purpose of this study is to develop CAL (Computer Assisted Learning) courseware for reading, which takes advantage of the anaphoric relation as a reading clue. The courseware enables readers to understand anaphoric relation visually. In addition, it is equipped with an online-dictionary. Using these functions, readers can then read the text without any assistance.

1. Introduction

Anaphoric reference is one of the elements of cohesion, which helps readers understand the organisation of a certain text, and is frequently seen in any text. Thus, in the field of linguistics, there are many studies on the mechanism and process of anaphoric reference. In the field of teaching reading, however, there are a small number of reading materials which utilise the teaching of cohesion comprehension as one of the reading strategies.

One of the reasons for the small number of such studies is the limitation of the usual textbooks and exercises. In such teaching materials, students are usually taught cohesion of the text only by means of questions or explanations about what the referential word stands for. In this case, the variety of teaching methods in cohesion comprehension is quite small. This

background makes the understanding of cohesion complicated and hard to learn especially for individual students.

This study proposes CAL (Computer Assisted Learning) courseware as one way of resolving the problem of individual cohesion comprehension. This CAL system shows complicated systems of reference and substitution visually on the computer screen, and helps students learn text and anaphoric relations much more easily and enjoyably than usual paper textbooks or exercise books.

2. Anaphoric Relation and Cohesion

Since anaphoric relation is one of the factors in cohesion, in the first place, the system of cohesion must be examined.

(1) Definition of Cohesion

Coherence is defined as a significant idea for the establishment of a certain text and also as a necessary relationship between each sentence and the general topic of the whole passage (Beaugrande and Dressler 1981, Moe and Irwin 1986). In addition, it is considered to be an aid used by readers to construct the whole meaning of the passage in the reading process. Hence, "When unable to establish coherence from the text, the reader will stop normal cognitive processes to search long term memory or to make linking inferences" (Moe and Irwin 1986). Since cohesion is a component of coherence, without cohesion, the establishment of coherence is extremely difficult. On the other hand, if a text displays cohesion, that is, if the reader can find measurable semantic relationships in the text, it follows that the reader will establish coherence more easily than if little or no cohesion exists (Moe and Irwin 1986).

Halliday and Hasan (1976) describe the role of cohesion in the text as a device for showing the semantic relations of the sentences which are syntactically independent. Cohesion is defined by Halliday and Hasan (1985) as follows:

COHESION: the set of linguistic resources that every language has (as part of the textual metafunction) for linking one part of a text to another

This study develops the CAL system based upon Halliday and Hasan's definition of cohesion, given above.

(2) Types of Cohesion and Anaphoric Relation

Halliday and Hasan (1976) shows five types of cohesion:1

- (1) Reference
- (2) Ellipsis
- (3) Substitution
- (4) Conjunction
- (5) Lexical cohesion
 - (a) Reiteration
 - (b) Collocation

Cohesion and anaphoric relation are discussed by Toda et al. (1986). They point out that in the types of cohesion, four of them, reference, ellipsis, substitution and lexical cohesion, correspond to anaphoric relation. Since reference and substitution can be shown visually, this study will take advantage of these as clues of reading in the CAL system.

3. Anaphoric Relation and Text Comprehension

Fox (1987) made a survey of the relative frequency of two anaphoric devices (Full NP and Pronoun) in conversational and written text. The survey shows that frequency of pronouns is larger than that of full NP in both texts, and that pronouns, which are one of the components of reference, are frequently appearing items in the text. (Table 1)

Table 1 *Proportion of anaphoric device*

	Full NP	Pronoun	Total
Conversational	87 (22%)	306 (78%)	393 (100%)
Written	548 (47%)	608 (53%)	1,156 (100%)

(Fox 1987)

There are several studies on the relationship between anaphoric relation and text comprehension.

Koga (1994a) performed an experiment to investigate the effects of anaphoric reference in native language. The research demonstrates that a sentence with anaphoric reference can be

memorised more easily, and that a series of sentences which include anaphoric reference makes the process of text comprehension more complicated. Gottsdanker-Willekens (1981) carried out an experiment to investigate the interference of certain anaphoric expressions on eighth grade students' reading comprehension. The subjects (n=103) were given cloze tests of anaphoric comprehension in which either 0%, 33%, 66% or 100% of the pronouns were placed by appropriate referents. The result of the cloze tests shows that the greatest improvement occurred in the 33% category of replacement. Comprehension declined with the 66% passage, and even more with the 100%. However, the 100% passage was still superior to the comprehension of the 0% passage. This shows that the use of anaphoric reference in some instances will interfere with reading comprehension of eighth grade students. These two studies suggest that the understanding of anaphoric reference is difficult even for native readers. Understanding of anaphoric reference for L2 readers, therefore, is considered to be a complicated item to acquire.

On the other hand, Jonz (1987) discusses the significance of understanding of anaphoric reference. He did some research to study the reading process of native and non-native readers, and reveals that, in processing uninterrupted text, non-native readers devote resources to building intersentential memory structures populated by lexically and referentially cohesive items to a greater extent than native readers.

The implication of these studies is that L2 learners need understanding of anaphoric references which frequently appear in the text, although it is a complicated matter to understand, even for native readers.

4. Teaching Comprehension of Anaphoric Relation

This section discusses teaching of the comprehension of anaphoric relation in the classroom. Gottsdanker-Willekens (1986) gives some examples of activities for comprehension of anaphoric relation:

- (a) Clozelike Techniques ... Some referents and pronouns are deleted. Students are told to fill in the blanks with proper words.
- (b) Modifications and Manipulations... Students are given passages which have no pronoun, then they are told to rewrite the passage with pronouns.
- (c) Pronoun Referent Assignment Techniques ... Students are given passages with references, then they are made to mark referents and pronouns with circles and underlining.
- (d) Questioning Techniques... After students read the passage, they are asked what the anaphor stands for, or after they read referentially ambiguous passage, they have a discussion on

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anaphoric relation .

Likewise, some studies examine the effects of the clozelike tests, visual marking and questioning (Williams 1983, Baumann and Stevenson 1986). On the basis of these studies, considered from the viewpoint of reading CAL system for comprehension of anaphoric relation, this system adopts the function of visual marking and questioning.

5. Development of CAL Courseware

(1) Flowchart of Learning

Since this courseware is of the non-linear learning type, students can learn on their own at their own pace. Figure 1 shows a typical example of learning flow, though the actual learning order depends on the learner.

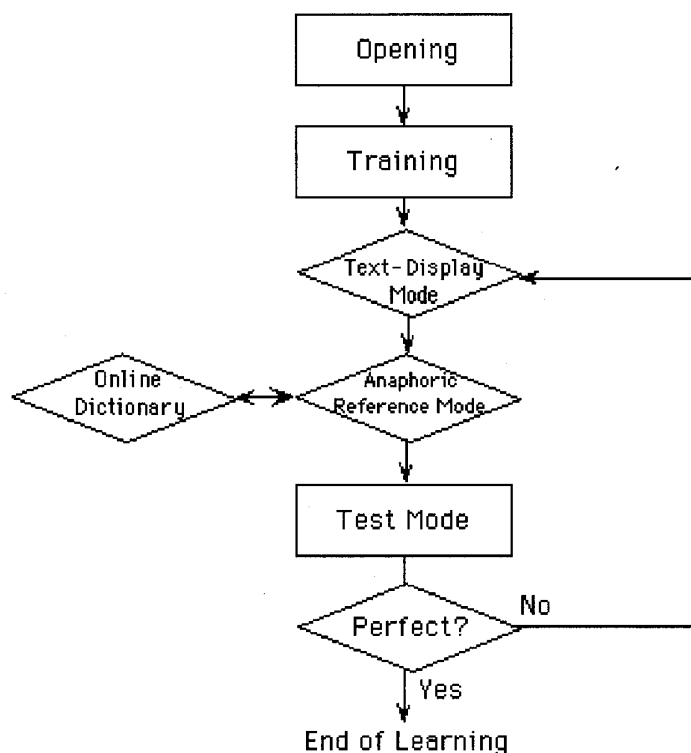


Figure 1 *Flowchart of Learning*

Before learning, the instruction of use is given. With this function students familiarise themselves with this system and the meaning of the icons on the buttons. When students learn how to use it, they can start learning. Once learning starts, students comprehend the text using 4 function modes: Text-Display Mode, Anaphoric Reference Mode, Online-Dictionary Mode and Test Mode. These function modes are described in following sections.

(2) Text-Display Mode

In Text-Display Mode, students can read the whole text displayed on the screen. They are only allowed to read the passage and move on to Anaphoric Reference mode. If the mode has many functions and buttons, students (especially curious ones) will be at a loss as to which function to use. This mode has been added in order to encourage the readers to read and think of the computer screen just like a blackboard or paper text. Moreover, this mode has an important role. In fact, students cannot quit the learning process in this mode. It avoids students' irresponsible escape from learning. In this way, this mode is also significant for the entire learning process. (Figure 2)

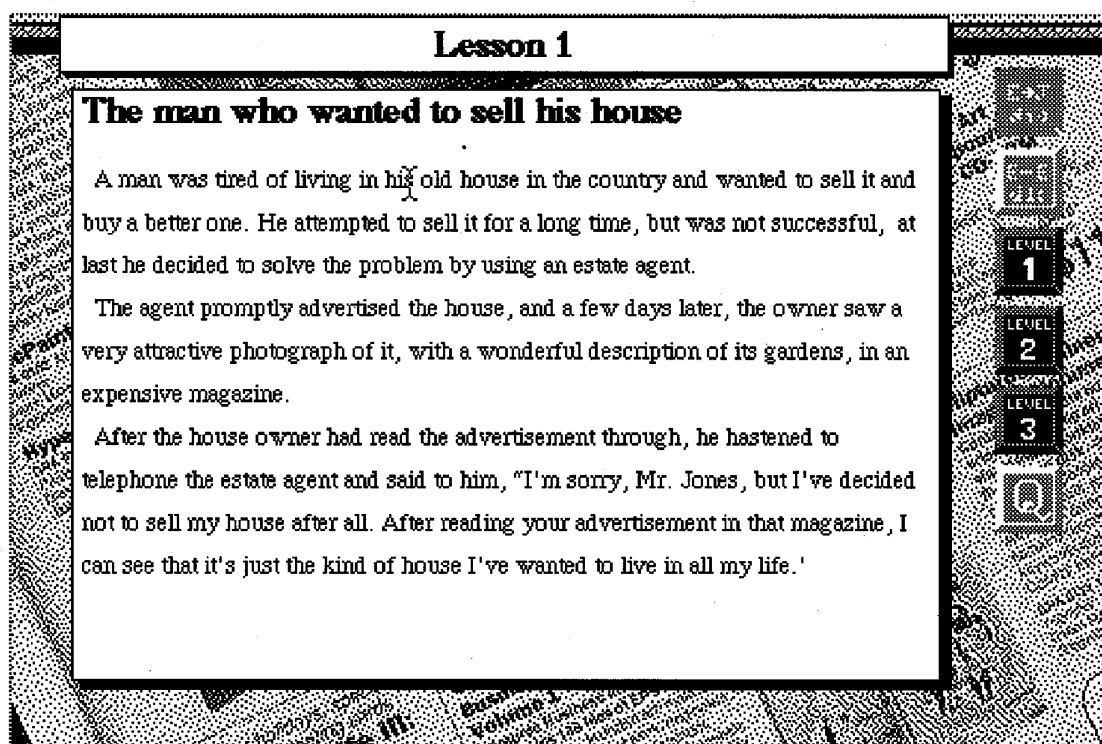


Figure 2 *Text-Display Mode*

(3) Anaphoric Reference Mode

Anaphoric Reference (Lesson 1) - Level 2 -

The man who wanted to sell his house

A man was tired of living in his old house in the country and wanted to sell it and buy a better one. He attempted to sell it for a long time, but was not successful, at last he decided to solve the problem by using an estate agent.

The agent promptly advertised the house, and a few days later, the owner saw a very attractive photograph of it, with a wonderful description of its gardens, in an expensive magazine.

After the house owner had read the advertisement through, he hastened to telephone the estate agent and said to him, "I'm sorry, Mr. Jones, but I've decided not to sell my house after all. After reading your advertisement in that magazine, I can see that it's just the kind of house I've wanted to live in all my life."

Figure 3 *Anaphoric Reference Mode*

This mode demonstrates visually how anaphors and referents are related to each other (Figure 3). Students can choose one of three levels of help, according to their level of proficiency. The effects of text-highlighting are shown in Koga (1994b). In order to investigate the effectiveness of highlighting, the subjects were given a passage in which either of three different highlighting methods were used: namely, highlighting all keywords in the passage (AK), highlighting keywords only in the topic sentences (KT) or highlighting none of the keywords (NK). The results of the comprehension tests showed that KT-method made a great improvement in the comprehension.

(4) Online-Dictionary

Iwasa (1985) carried out an experiment to investigate interference of the use of a dictionary in the reading process. The results shows that the use of a dictionary in reading decreases the learning efficiency. Another experiment using an online-dictionary in Iwasa (1990), nevertheless, shows that students who look up the online-dictionary longer show greater comprehension of the text. These results discuss the potential of online-dictionary, which affords more rapid lexical-

access and interrupts the process of reading less than an ordinary dictionary.

In this courseware, students consult two dictionaries: MacJdic 1.3.0 (English-Japanese Dictionary) and Longman Dictionary of American English (Macintosh Version)

(Figure 4)

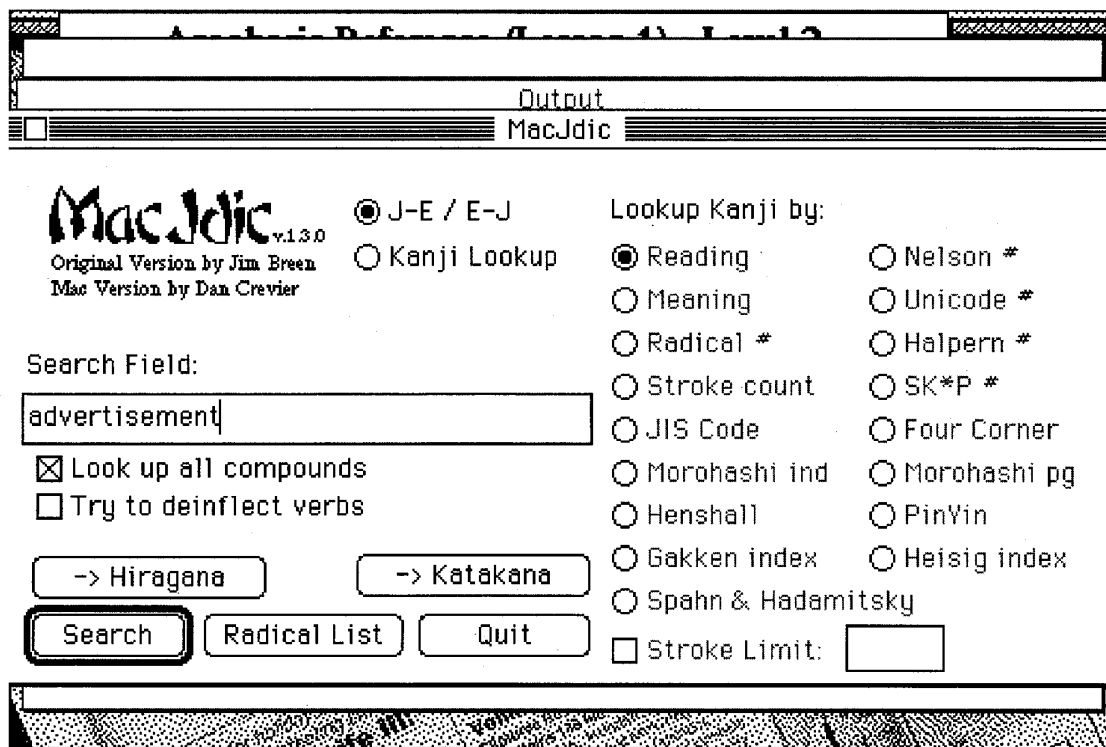


Figure 4 *Online-Dictionary*

(5) Test Mode

As discussed in an earlier section of this study, this system has a questioning stage called the Test Mode. Students can check the test whenever they think they have understood the whole text. Ten multiple-choice questions are selected at random among questions on vocabulary, anaphoric relation and context. For extra convenience, students use the mouse as the answering device. (Figure 5)

When ten questions are given, the student is supposed to understand the whole text and finish learning if he/she gets the full marks. Otherwise, they are forced to return to the Text-Display mode to continue the lesson. This method is called Answer until Correct (AUC). In this method, students have to try the incorrect items again and again until they become correct. Clariana et al. (1991) investigated the effects of using different forms of computer-based feedback on high school students' learning of science material. They examined five feedback conditions:

Koga : A Computer Assisted Learning System for Developing Reading Strategies for Cohesion Comprehension knowledge of correct response (KCR), delayed KCR, AUC, questions only (no feedback) and no questions. The results show that AUC feedback becomes more advantageous in effectiveness.

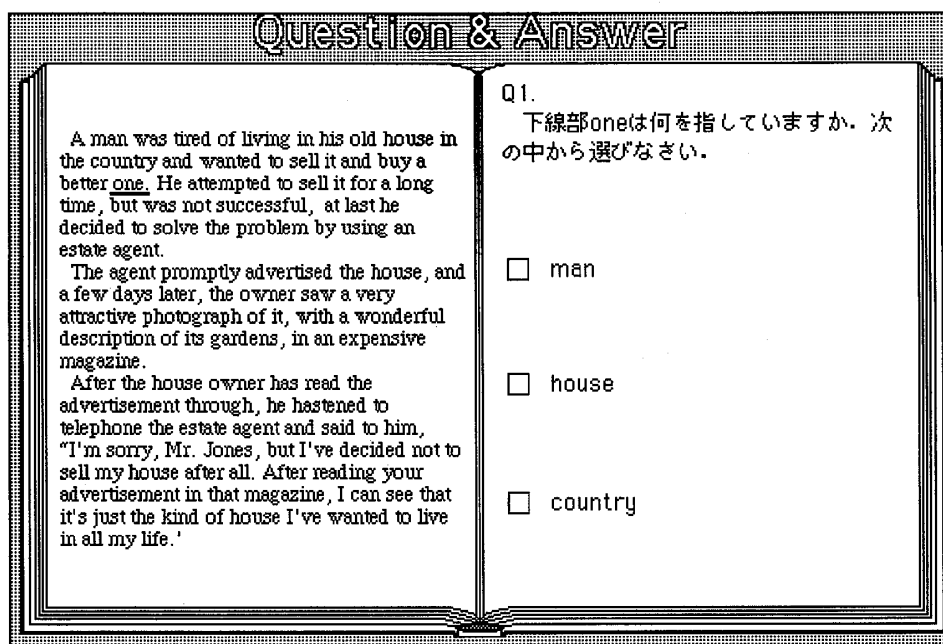


Figure 5 Test Mode

6. Effectiveness of This System

The post- and pre-test was given to 10 Japanese university students in order to research the effectiveness of this system. The subjects were 10 undergraduate students of a national university, who were majoring in second language education. As figure 6 shows, the results suggest that the functions of this system help readers' comprehension. To reach a more precise conclusion, more experimentation is needed in the future with a larger number of subjects.

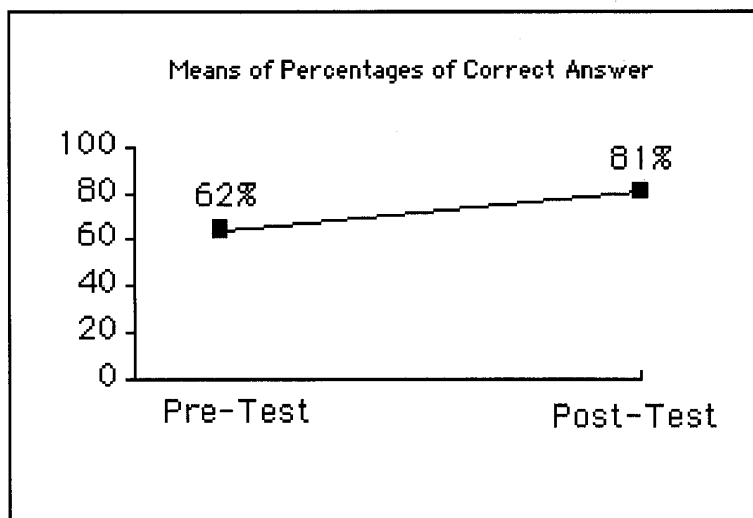


Figure 6 The Results of Pre- and Post-Test

Notes

1 ... In Halliday and Hasan (1976), the five types of cohesion are described in different chapters. In Halliday and Hasan (1985), however, ellipsis and substitution are considered to be variations of the same type of cohesion, and are discussed in the same chapter. Therefore, four types of cohesion exist: (1) Reference, (2) Ellipsis and Substitution, (3) Conjunction, (4) Lexical cohesion

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APPENDIX

Reading material (cited from Hill, L. A. 1977)

A man was tired of living in his old house in the country and wanted to sell it and buy a better one. He attempted to sell it for a long time, but was not successful, at last he decided to solve the problem by using an estate agent.

The agent promptly advertised the house, and a few days later, the owner saw a very attractive photograph of it, with a wonderful description of its gardens, in an expensive magazine.

After the house owner had read the advertisement through, he hastened to telephone the estate agent and said to him, "I'm sorry, Mr. Jones, but I've decided not to sell my house after all. After reading your advertisement in that magazine, I can see that it's just the kind of house I've wanted to live in all my life."