

## **Chinese L1 Schoolchildren Reading in English: The Effects of Rhetorical Patterns**

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### **Abstract**

Reading comprehension can be seen as a process dependent on the interaction of 'top-down' and 'bottom-up' processes. An important, but neglected, feature of this process concerns the effects of rhetorical organization. This article describes an experiment in which four rhetorically different texts, with identical subject matter, were read by 490 Hong Kong Chinese school children (mean age 14.1), studying in English (their L2). Comprehension was measured by a cloze procedure and by recall protocols. One way ANOVA was used to investigate the effects of different texts on the test scores. The results showed a clear difference in comprehension between the text types and suggest that pedagogical support to increase awareness of rhetorical patterns would be beneficial. *Key words:* rhetorical organization, comprehension, Hong Kong Chinese, text analysis, text structure

### **Introduction**

The comprehension of text requires the use of skills including word knowledge, syntactic knowledge, knowledge of the topic, knowledge of text structure, and cohesion. (For an extensive list of such strategies see Pressley & Afflerbach, 1995.) The readers' social and cultural values will also influence comprehension and as a result a text may be interpreted differently by different people. Reading may also be seen as a process in which the reader may sequentially deal with letters, words and sentences (a so-called bottom up approach, essentially text driven). At the same time the reader may deal with larger units of text (a top-down approach, more likely to be reader orientated). In addition, rhetorical patterns or structures influence comprehension. An understanding of how such patterns are formed and used provides clear help in reading comprehension. This article considers the effect on comprehension of different English rhetorical patterns. The context of the study is a Chinese speaking society where reading in English is required as part of an established English medium curriculum.

A rhetorical pattern is part of the macrostructure of a text and it contains the logical organization of the text which the writer has used to represent the intended meaning. Meyer (1975) and Armbruster (1984, 1986), among others, have recognized five groups of rhetorical relations in expository text:

*Listing*: a listing of items or ideas where the order of presentation of the items is not significant.

*Comparison/contrast*: a description of similarities or differences between two things.

*Temporal sequence*: a sequential relationship between ideas or events considered in terms of the passage of time.

*Cause-effect*: an interaction between at least two ideas or events, one considered a cause or reason and the other an effect or result.

*Problem-solution*: this is similar to the cause-effect pattern in that two factors interact, one citing a problem, the other a solution to that problem.

The importance of these structures in reading comprehension, particularly for children, has been observed by Brown, Day & Jones (1983); Winograd (1984); Taylor (1986); Slater & Graves (1989) and Dole et al. (1991). McGee & Richgels (1985, p. 739) comment that "...research... has shown that the structure of text and how adeptly a reader recognizes that structure affects the amount of information the student remembers". Leon & Carretero (1995, p. 204) note the importance of text structure in "helping readers to differentiate between important and unimportant information as well as in the organization and recall of information".

Much of the research work in this area has been with first language (L1) studies. Examples are: Meyer (1975); Meyer, Brandt & Bluth (1980); Urquhart (1984); Meyer & Freedle (1984); Raphael et al. (1986). Research in second language (L2) has been more limited, for example Flick & Anderson (1980); Carrell (1984, 1985); Raymond (1993); Leon & Carretero (1995). Research has considered whether rhetorical structure affects comprehension, whether knowledge of rhetorical patterns can be successfully taught (e.g., Davis et al., 1988, among others) and whether different text organizations have different effects on comprehension. Research has also compared variations in the comprehension of rhetorical structures between different cultural groups. For example Carrell (1984) asked Spanish, Arabic and Oriental students to recall texts re-written in forms representing *comparison-contrast*, *cause-effect*, *problem-solution* and *collection of description* (defined as a *listing* structure under the definition given earlier). Carrell's work was reduplicated by Foo (1989), Goh (1990) and Talbot et al. (1991) using exactly the same texts. For all these investigations the rhetorical pattern of the text was found to have an effect on reading comprehension as measured by recall. At the same time however, different language and cultural groups performed in different ways. Carrell found that the more loosely controlled structures (such as collection of description) seemed to be the most difficult to comprehend. This area of research has remained underdeveloped, however. Small samples have been the norm and the ideas initiated by Carrell have not been extended to other texts or with specific cultural groups. The study reported here was aimed at filling this gap in research knowledge.

## Hypotheses

The study described below proposed the following hypotheses:

1. The rhetorical organization of English (as represented by four different patterns) will affect the reading comprehension of native Chinese school pupils.
2. The gender or English language proficiency levels of the Chinese school pupils will not have a significant effect on reading comprehension.<sup>1</sup>

## Methodological Difficulties

Preparing an investigation in this field poses a number of methodological difficulties. The experiment must attempt to isolate rhetorical organization so that comprehension is not affected by other factors, such as the background knowledge of the reader or the lexical or syntactic difficulty of the text. This is clearly not an easy task.

Among the problems evident in previous research in this area of study have been:

1. The use of texts which do not take into account reader background knowledge. Texts have sometimes been about widely varying topics ( e.g., McGee (1982) used four texts about *sharks*, *cats*, *baking a cake* and *textiles*).
2. The texts used should be accurate representations of the rhetorical patterns selected. The methods used to construct the rhetorically different paragraphs used in previous experiments have not always been adequately explained. The exceptions have been Carrell (1984) and Urquhart (1984). However, in most of the studies listed earlier, inadequate information is provided about text construction, making it difficult to establish convincing principles on which further studies might be based.
3. The proficiency levels of the subjects used in the study have often been unclear or unstated, making comparisons between groups difficult.
4. Comprehension testing measures have varied. Recall protocols have been commonly used, but the methods by which these protocols have been scored has not always been explained. The instructions given to subjects have frequently not been stated or have been unclear. This has meant, for example, that subjects may or may not have known that they would be asked to recall after doing the initial reading of the texts. This knowledge coupled with differences in the time between recall and reading, the nature of any distraction tasks, etc., may have influenced the final results. Cloze procedures of varying kinds, word insertion tests and multiple choice questions have also been used to measure comprehension.
5. The samples used in studies have frequently been quite small and this has made generalizations difficult, e.g., McGee (1982) n=60; Kintsch & Yarbrough (1982) n=40 (experiment 1), n=32 (experiment 2); Carrell (1984) n=60 subjects; Foo (1989) n=40; Davis, et al. (1988); Carrell (1992) n=45; Raymond (1993) n=43.

Within this array of studies there has been little comment about the relevance of studies in contrastive rhetoric. How far does the rhetorical patterns common in the subjects' first language

affect the readers' ability to understand texts in English when it is their L2? Are different language groups affected in their reading comprehension of various rhetorical forms in English by the contrastive influences of their first language? Culture specific rhetorical patterns and preferences have been supported by the work of Connor (1987), Clyde (1987), Eggington (1987) Hinds (1990), Scollon (1997) and Scollon and Scollon (2000). It could be that English text based on western styles of direct linear patterns is more inaccessible to L2 readers and writers.<sup>2</sup> The cultural and social orientation of the reader is clearly an important ingredient of reading comprehension.

### *A note on Chinese learning styles*

Before describing the study, a background note is necessary on the context in which the research took place. The setting was Hong Kong secondary English medium schools. These are based on the British colonial pattern, but are also heavily influenced by Confucian traditions. In brief, these traditions stress diligence, placing more importance on effort than ability (see Hua & Salahi, 1991) and focus on achievement, self-reliance, competition and the promotion of communal over individual interests. More reliance is placed on memorization. There is evidence that Chinese students have better memories than western students, apparently because of the training required to learn Chinese characters (Ballard & Clanchy, 1984; Murphy, 1987; Hoosain, 1991). These improved memory skills may also influence reading styles (Unger, 1977; Liu, 1986). Hong Kong schools have been, until recently, 90% English medium. English proficiency levels remain variable, but relatively low, with teachers resorting to a mixed code of English and Cantonese. Styles in language learning and reading may be based on what Johnson & Ngor (1996) call "lexical and survival strategies". This entails students breaking down reading texts into sub-sections for decoding. Words and phrases may be interpreted without reference to the rest of the sentence. Johnson & Ngor suggest that the students use a lexical style to overcome the inadequacy of their English when presented with English medium textbooks. These reading and learning styles are referred to again later in this article when discussing the results of the study.

## **Methodology**

In order to assess if rhetorical organization affects comprehension, the rhetorical patterns have to be isolated from other influences on comprehension. The early part of this methodology section describes how this was done and also explains how the comprehension measures themselves were selected and used.

The reading passage used in this experiment was chosen from a secondary school science textbook (Chan et al., 1993) used by the majority of English medium secondary schools in Hong Kong (see survey, Sharp, 1999). Four hundred and ninety form 3 pupils (mean age 14.1) were tested with four versions of a text rewritten from a health education chapter in the textbook. The topic, *healthy eating*, had been taught in integrated science classes during the preceding term for all pupils. It was therefore assumed that knowledge of the topic would be as similar as possible for all pupils (although this cannot take into account pupil absence, lack of attention or motivation when the topic *healthy eating* was taught in science lessons). The topic, *healthy*

*eating*, has been frequently discussed in the Hong Kong media, including television, and so is likely to have been familiar to the pupils. A base text was chosen which allowed four re-writings into different rhetorical forms: *description*, *cause-effect*, *listing* and *problem-solution*. Text lengths were very similar, 147, 165, 143 & 167 words respectively. The length of the texts is similar to reading comprehension assessment done by other researchers: Carrell (1982) used texts of 183 words; Bernhardt (1983) 139/134 words; Carrell (1984) 135 words; Urquhart (1984) 178/180 words. The actual texts used are shown in Appendix A.

### Text Construction

Each text was given an identical introductory sentence.

The problem-solution construction divided the information into two parts:

1. the problems presented by nutritional deficits
2. the solutions to these deficits

Discourse markers were added:

*the problems of . . . may be solved. . .*  
*a particular problem*  
*the problems of. . .*  
*the solutions to these problems*

The listing construction was indicated by enumerating the substances required for good nutrition and at the same time indicating which foods provided these substances.

Discourse markers were added:

*follow the advice in the list below*  
*the first, second, third, fourth, finally*

Although cause-effect is implicit in the text, this is not made explicit and the listing of the substances is the predominant form used.

In the cause-effect text the causation pattern was indicated by three conditional sentences

1. *If our bodies are provided with food . . . then we are less likely to become ill*
2. *If we are able to eat plenty of carbohydrates.. then the body will be provided with energy.*
3. *If we eat too much animal fat instead of vegetable fat . . . then this may cause heart attacks.*

Discourse markers were used explicitly to indicate causation:

*cause . . . disease*  
*result in illness*  
*are a cause of problems . . .*  
*may cause heart attacks*  
*because of high animal fats*

The interrelationship of the components was unstructured in the description text, with no clear relationships being evident. The ideas are associated, but they are not sequential or chronological. They are rather a collection of attributes about the nutritional value of various foods, with no evident hierarchical organization. The description text therefore is not as highly organized as the other three texts.

### *Judgement of rhetorical organizational*

It is recognized that there is a certain amount of overlap in the text reconstructions. The problem-solution construction contains elements of causation. The listing construction contains elements of both of these. However, the texts exemplify the rhetorical forms required by being *essentially* different - a difference confirmed by eight professional colleagues (four Chinese native speakers and four English native speakers) who were asked to pass judgements on their organization. They agreed one hundred percent on the recognition of the rhetorical forms.

### *Statistical information*

A "readability score" was calculated for each of the texts used in this study using the facility on Word 6 software. The weaknesses of such formulae have been made plain (e.g., Carrell, 1987), particularly in L2 situations. However, others indicated that formulae do have a some validity (e.g., Chall & Dale, 1995; Harrison, 1986; Asker, 1999) and they have been used here to offer a further check, along with text length, number of paragraphs and number of sentences, as to the comparability of the texts. The four texts all have very similar profiles when these readability measures are used.

## **Reading Comprehension Assessment**

A wide range of methods have been used to measure reading behaviour and reading comprehension. A *text based* cloze procedure and a recall protocol were considered the most appropriate methods, as detailed below. Both these methods have been widely used in reading comprehension investigations and both allow a large number of subjects to be assessed.

### *Cloze Construction*

Cloze procedures have prompted much discussion and criticism. However, there is ample evidence that they do measure reading comprehension and higher order processing. Studies supporting cloze have been reviewed by Jonz (1990). The type of cloze construction selected was based on Farhady & Keramati's (1996) research into the superior qualities of a *text based* design. It was felt that this design overcame many of the criticisms of cloze which have suggested that the procedure only assesses knowledge of local coherence or vocabulary (see criticisms of Alderson, 1979). Farhady & Keramati's design calculates deletion rates after taking into account the number of noun phrases in a text. Farhady & Keramati contend that such a design takes better account of the discorsal and linguistic structure of the language used and is a superior test of comprehension because of improved reliability and validity. Noun phrase calculation was based on the following rules: conjoined NPs were counted as single units; complex NPs (NPs with embedded NPs) were treated as single units and pronouns were ignored. The correct selection of NPs was confirmed by two other raters. Acceptable and exact word scoring were used. For the former a response had to be grammatically correct and provide a suitable meaning within the context of the passage as judged by a native English speaker. Correlation between acceptable and exact scoring was 0.899. Deletion rates for the text were: *description* every 5<sup>th</sup> word, 25 deletions; *listing* every 6<sup>th</sup> word, 25 deletions; *cause-effect* every

6<sup>th</sup> word, 21 deletions; *problem-solution* every 6<sup>th</sup> word, 25 deletions. Deletion rate changes between 5 and 6 are not likely to have an effect (see Porter, 1983). A sample cloze, with calculation included, is shown in Appendix B.

The second testing method selected was a recall protocol. This has been the most common method employed in testing reading comprehension in research of this sort (see earlier listed research studies). The procedure is not hampered by possible inference from test items and is more likely to focus on the communication between text and reader. The assumption is that recall indicates something about the readers' assimilation and reconstruction of text information and therefore reflects comprehension (Gambrel, Pfeiffer & Wilson, 1985). It requires that the text be divided into *idea units* (e.g. Johnson, 1970; Meyer, 1975). An *idea unit* (also called a *linguistic unit* by Bransford & Franks, 1971, and Carrell, 1983, and an *information unit* by Roller, 1990) is the smallest number of words necessary to express a thought or idea. The subject reads the text and his/her recall is measured and compared with the number of units in the original text. Comprehension is therefore measured by the amount of information in the response. Scoring required the presence or absence of the gist of the text content. The texts in this study were segmented according to Johnson (1970), with "pausal boundaries" being designated to allow quantitative assessment of recall. In order to account for qualitative/importance level differences in recall, the idea units were also rated for importance within the text. The quantity and quality/importance of pausal units was determined by asking eight university academic colleagues to assess pausal boundaries and importance levels. Agreement was reached by totaling the choices made by the raters (see similar methodology used in studies by Armbruster, Anderson & Osterag, 1987 and Fuchs, Fuchs & Maxwell, 1988). A template was then available for scoring purposes (see Appendix C for an example).

The Johnson (1970) system of using idea units was selected as the most suitable for this research study because its application is simpler than the Meyer (1975) system. It is, in any event, seen as correlating closely with the Meyer system (Bernhardt & Deville, 1991) and may be considered more suitable for subjects whose level of English may cause them to produce recalls with syntactic errors, or which are vague or confusing.<sup>3</sup> Recall protocols have been frequently used in L2 situations (Connor, 1984; Lee, 1986; Steffenson, 1988, Bernhardt, 1991; Lund, 1991). Bernhardt (1991) has described them as a "purer" form of testing, which avoids the interference which exists in tests where choices have to be made by the tester. Written recalls also allow a large number of subjects to be tested, thus avoiding the earlier criticism that samples in this area of research have been too small for realistic generalizations. Recall protocols, however, allow the possibility of rote learning without real comprehension occurring. Attempts were made to avoid this problem by not telling the subjects that they would be asked to recall and by providing a distraction task (a multiple choice questionnaire asking for comments about the text) between the initial reading of the text and the request for a written recall. Scoring reliability was obtained by correlating 50 sample assessments with those of another rater. This produced a correlation of 0.94.<sup>4</sup>

## Subjects and Procedure

Four hundred and ninety band 1 children, in three schools, were tested, one boys' school, one girls' school and one co-educational school.<sup>5</sup> All schools followed an English medium

curriculum, all subjects were Chinese native speakers. The mean age of the subjects was 14.1. The banding system ensured a reasonably consistent standard of English and Chinese among the subjects. Hong Kong school internal English exams were used to divide the subjects into four ability groups. These groups were used as a criterion against which to compare the results of the rhetorical structure comprehension tests. This division into ability groups was to allow consideration to be given to the effects of different proficiency levels on the results of the rhetorical pattern comprehension testing.

The four rhetorically different texts were then distributed evenly throughout each of the four ability groups. Each student received an envelope containing one reading text (either *description*, *cause-effect*, *listing* or *problem-solution*), a cloze test on the same text and a questionnaire (as a distraction task). Students were given a brief introduction informing them that the reading was to be about *healthy eating*. They were then given eight minutes to read the text. After replacing the text inside the envelope they then completed the questionnaire, which took a further five minutes. At this point the subjects were told that they should write a recall in English. Ten minutes were given for this. The recalls were the also placed in the envelope. The cloze test was then attempted (a further ten minutes).

## Results

Key: cloze 1 - exact word score; cloze 2 - acceptable word score

Text 1 - description, Text 2 – cause/effect, Text 3 - listing, Text 4 - problem/solution

The tables below provide a summary of the test scores in percentages. One way ANOVA was used to investigate the effects of different texts on the test scores.

### **Hypothesis 1: "That the rhetorical organization of English (as represented by four different patterns) will affect the reading comprehension of native Chinese school pupils"**

As expected cloze 1 (exact word scoring) and cloze 2 (acceptable word scoring) were highly correlated (see Table 1). Cloze testing indicated significant differences between the four rhetorically different texts, at a p-value < 0.01 level, with the most loosely organized (*description*) scoring significantly higher. *Cause -effect* scored lowest and appeared to be the most difficult to comprehend. (Table 1)

The results of the recall protocols (Table 2), using a quantitative measure, (based on the number of idea units recalled), indicated no significant difference among the text types. When consideration is given to the qualitative/importance rating of recall, the more loosely organized texts (listing and description) again score most highly (p-value<0.05).

There is therefore partial support for Hypothesis 1, with strong indications from cloze and importance/qualitative level recall scores that the rhetorically different texts affect reading comprehension.



Table 1: Cloze 1 and cloze 2 test scores for the four texts

	Cloze 1 Mean (S.D.)	Cloze 2 Mean (S.D.)	Differences in mean	Correlation (r)	t-statistics
Text 1	61.5 (14.0)	68.7 (15.3)	7.19	0.901***	-12.083***
Text 2	42.4 (14.2)	47.2 (15.6)	4.72	0.897***	-7.646***
Text 3	43.2 (19.9)	53.0 (21.1)	9.87	0.922***	-13.348***
Text 4	50.9 (16.2)	58.9 (19.1)	8.03	0.944***	-13.325***
Overall	49.5 (17.9)	56.9 (19.6)	7.43	0.899***	-22.485***

\*\* p-value &lt; 0.05

\*\*\* p-value &lt; 0.01

Table 2: Cloze 1, cloze 2, recall (quantitative) and recall (importance/qualitative) scores for the 4 texts

	Cloze 1 Mean (S.D.)	Cloze 2 Mean (S.D.)	Recall (quantitative) Mean (S.D.)	Recall (importance qualitative) (S.D.)
Text 1	61.5 (14.0)	68.7 (15.3)	33.8 (15.9)	33.8 (17.4)
Text 2	42.4 (14.2)	47.2 (15.6)	35.4 (15.6)	32.4 (16.7)
Text 3	43.2 (19.9)	53.0 (21.1)	37.3 (21.2)	38.5 (22.0)
Text 4	50.9 (16.2)	58.9 (19.1)	35.0 (21.6)	32.2 (22.7)
Overall	49.5 (17.9)	56.9 (19.6)	35.4 (18.7)	34.2 (19.9)
F-statistics	37.05***	32.74***	0.76	3.934**

\*\* p-value &lt; 0.05

\*\*\* p-value &lt; 0.01

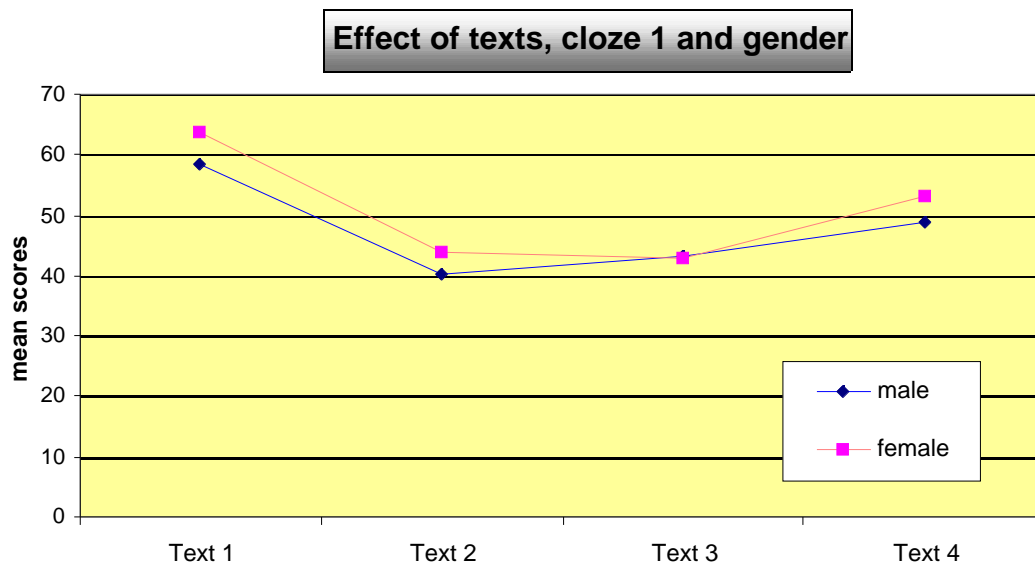
*Gender and ability/proficiency grouping*

**Hypothesis 2: That the gender or English language proficiency levels of the Chinese school pupils will not affect any results emanating from Hypotheses 1.**

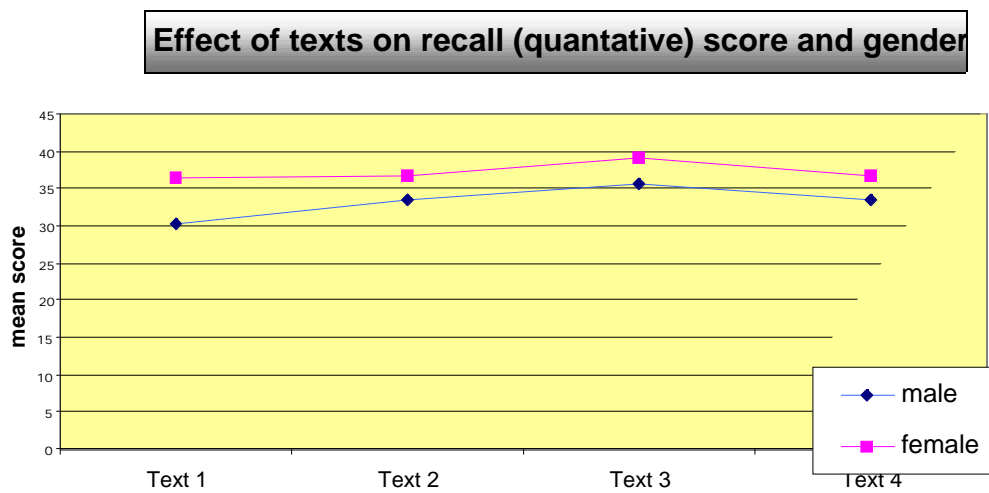
The results for gender and proficiency (divided into four ability groups) are shown below in graphs 1-6. (Cloze 1 & 2 were highly correlated so only cloze 1 is shown).

*Gender.* The results shown in Graph 1 indicate a similar rank order of texts to that of Table 2 above. The graphs also demonstrate that the difference in the mean scores is consistent across the four texts. Girls score higher for three out of the four texts compared to boys (Graph 1). There are no substantial differences between the texts for recall quantitative scores for either boys or girls, but the mean scores remain consistent across the four texts (Graph 2). For recall qualitative, (Graph 3) text 3 (a more loosely organized pattern) scored higher. The results provide strong, but not complete, support for Hypothesis 2.

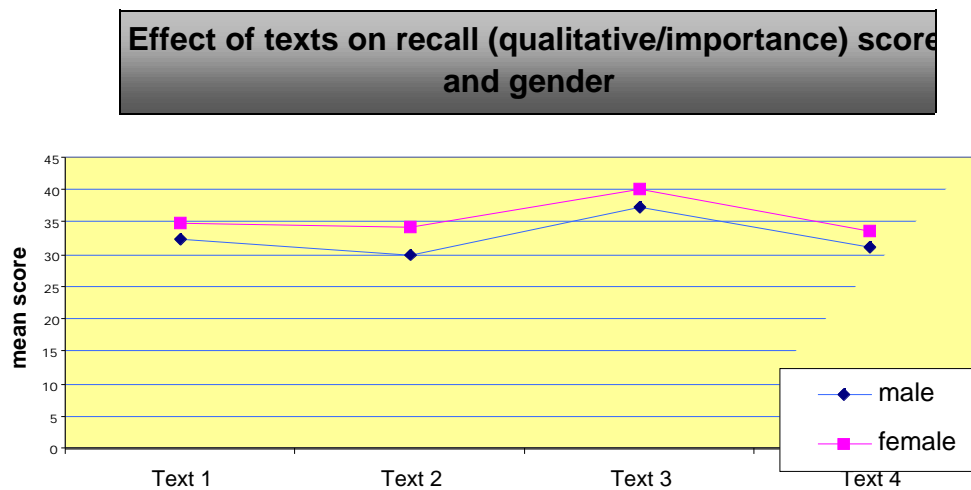
Graph 1



Graph 2



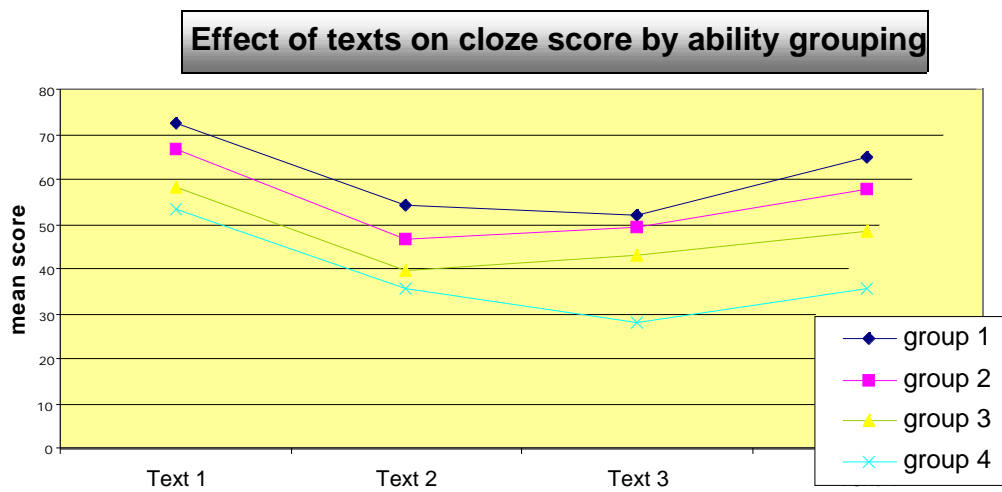
Graph 3



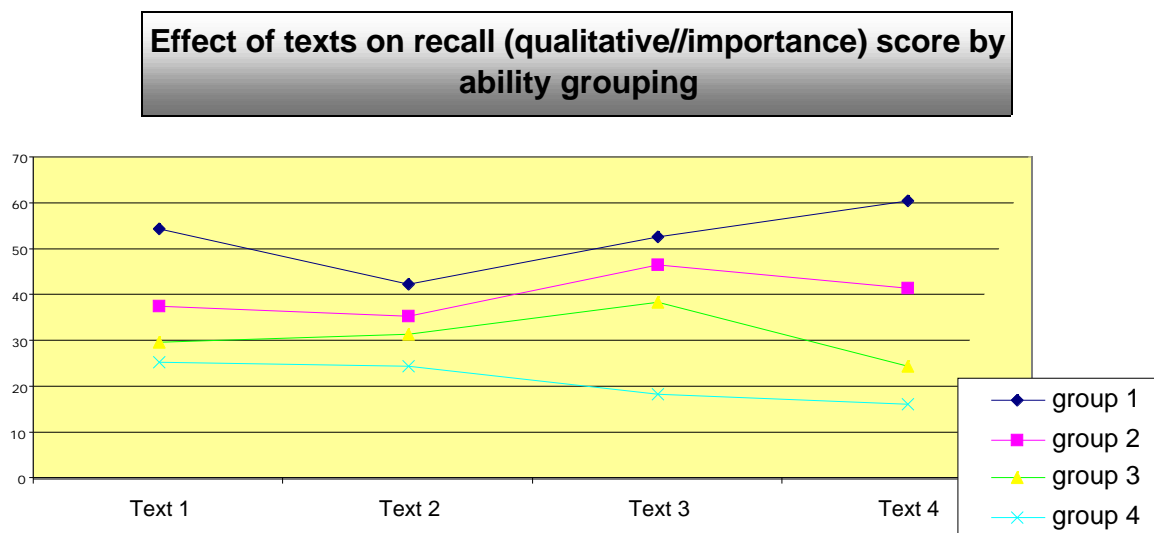
*Ability grouping/proficiency.* The rank order of the texts for different proficiency groups was also similar (but not identical) to Table 2, so English proficiency levels appeared to have little effect on rhetorical preferences (see Graph 4). Text 1 (*description*) appeared again to be easiest to comprehend. The rank order of scores for recall qualitative scores (Graph 5) indicated a less consistent result, with no clear rank order between the four ability groups. Text 3 (listing, a more loosely organized text) appears to be more difficult for ability group 4 for qualitative scoring (Graph 5), and quantitative scoring (Graph 6).

Throughout these results the pattern of scores for the cloze tests and the recalls, quantitative and qualitative, was consistent with the rank order of the school proficiency tests. Those scoring most highly in the tests used in this experiment also scored most highly in the internal school proficiency tests provided by the school administration.

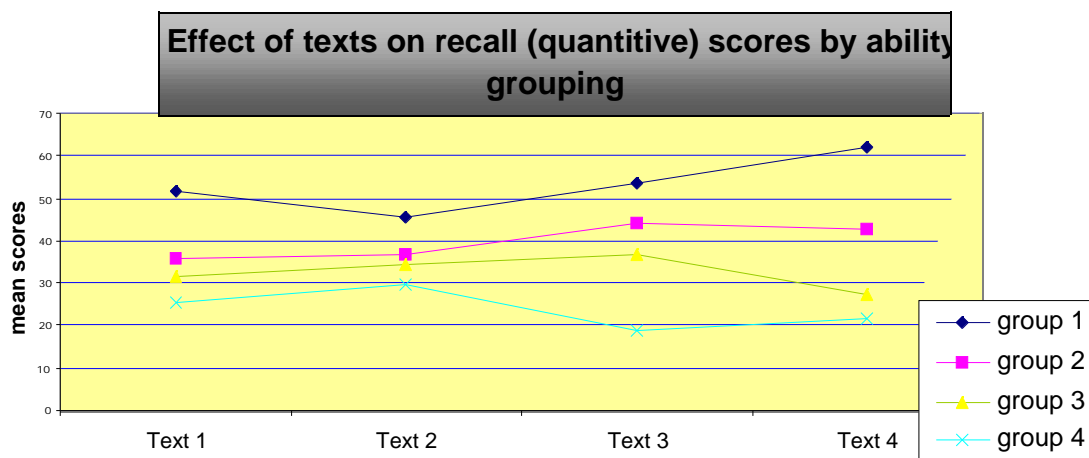
Graph 4



Graph 5



Graph 6



## Discussion

The specific aims of this study, stated in the form of two hypotheses, were to investigate if different rhetorical organizations affected comprehension. The results show that for all students there is a clear difference in text comprehension at a  $p$ -value  $< 0.01$  level for cloze scores, and at a  $p$ -value  $< 0.05$  for qualitative recall scores. Quantitative recall scores show no significant difference between the texts. Surprisingly, it is not the more tightly organized texts that score highest, as was most frequently found in other investigations of this type with L2 learners (e.g., Carrell, 1984). In cloze scoring the *description* text was found to be significantly easier for all proficiency or ability groups and both genders.

These accord with previous research in that there is a clear demonstration of rhetorical patterns affecting reading comprehension.

Although no significance was found between the number of idea units recalled between the different rhetorical structures, they do offer some interesting comparisons when the percentage of idea units actually recalled are compared with previous studies. Carrell's (1984) L2 subjects recalled less than 25% of the ideas, Talbot (1993) less than 30%. In the present study recall ranges between 33-37%. This is impressive when it is remembered that the subjects were form 3 (14.1 years old), not the more mature college students used by Talbot et al. (1993), Foo (1989) and Carrell (1984) and lends support to the suggestion that these students may have better memory skills. These result might be interpreted as a reflection of the Chinese learning styles mentioned earlier. Mohan and Lo (1985) report that the learning experience in Hong Kong emphasizes accuracy at the sentence level. This was also found in a more recent study (Johnson and Ngor, 1996) mentioned earlier. This factor may help explain the lack of any significant difference in quantitative recall for the four texts: low level word-phrase based reading strategies and rote learning /memory factors may have over-ridden the effects of rhetorical differences. Hong Kong has an exam orientated system. No suggestion was made to students that they would

be required to recall what they had read, but they may have assumed that a test would follow, because this was the usual follow-up to reading. Text organization may have been irrelevant to students used to this style of learning and more accustomed to using lexically based strategies and frequent memorization in school.

Some of the results in this experiment might be explained by Chinese-English linguistic interference, although it is not entirely clear what form this may take. Chinese is traditionally thought of as having a SVO word order. Rutherford (1983) sees Chinese as topic-prominent and English as subject prominent. Perhaps this difference may have caused additional processing difficulties for Chinese native speakers reading English and may account for text 1 scoring more highly. Unfortunately some researchers, such as Sun & Givon (1985) and Wang (1988) in doing statistical studies on the frequency of SVO sentences in Chinese, found no clear dominance for SVO order. So it would seem that the inconclusive position on Chinese SVO order removes this, at least at the moment, from consideration, but may suggest a possible influencing factor.

The re-constructed texts might be considered short and unnatural. Authentic passages may often reflect more than one structure. Text 1 (description) had no explicit use of signaling words (cohesive devices). Johns (1984) has noted the under-use of such words by Chinese users. Hu, Brown & Brown (1982) have also noted the difficulty that Chinese speakers have with such cohesive devices. Young (1982, p.83) noted that Chinese speakers favoured an indirect approach and that English connectives, such as *because*, *as* and *so* were ". . . invested with meaning . . . different from their usual association in English". It may be that the cohesive devices in text 2, 3 and 4 caused *extra* difficulty for the school subjects in this experiment, and this goes some way towards accounting for the significantly higher score for text 1. Western rhetorical style is not taught in Hong Kong (Bodycott, 1997; Mohan and Lo, 1985). It may be that a reader accustomed to western, linear, text organization would find text 1 less logical and comprehensible, but a reader accustomed to Chinese rhetorical conventions would not agree.

For cloze testing, text 2 (cause-effect) produced the lowest score. It may be the comprehension difficulty that this indicates was caused by the fact that the *cause-effect* text contained counterfactual statements, considered by Bloom (1981) and Kaplan (1987) as being more difficult for Chinese speakers. Counterfactuality is defined by Kaplan (1987, p.4) as "if-then" statements "marked by past tense in the dependent clause and an appropriate modal+infinitive in the independent clause . . ." Kowal (1998) agrees with Bloom (1981) that counterfactuality may be more limited in Chinese. ". . . Chinese speakers in general, by contrast to their English speaking counterparts, do not have at their disposal already prepared cognitive schemas specifically designed for interpreting information in counterfactual way" (Bloom, 1981, p.28).

Text 2 (cause-effect) does have three sentences which might be described as counterfactual:

1. *If our bodies are provided with food . . . then we are less likely to become ill*
2. *If we are able to eat plenty of carbohydrates.. . then the body will be provided with energy.*
3. *If we eat too much animal fat instead of vegetable fat . . . then this may cause heart attacks.*

## Conclusion

The results of this investigation demonstrate clear differences in processing predilections for rhetorically different texts. The investigation used a much larger sample than earlier work in this area and it also used carefully controlled and more comprehensive methods of comprehension testing and text construction. While there are possible confounding factors, nevertheless this research is in line with previous work in that it clearly demonstrates that rhetorical patterns do affect reading comprehension. Further support is thus given for providing non-native readers of English with information regarding text structure organization, in order to improve reading comprehension. This seems particularly relevant to the Chinese learners in this study who had unexpected difficulty with more tightly organized texts. It may be that ESL teachers' presuppositions about text comprehensibility may not necessarily correspond with that of learners and that practice with common rhetorical forms in English may be beneficial. Suggestions have been made in a number of sources as to how rhetorical organization may be taught and practiced, even with young students (e.g., Piccolo, 1987, Bodycot, 1997). An examination of the type of structures that are inherent in Chinese may help student awareness of rhetorical patterns in L2 reading. There should be more study of L1 rhetorical patterns in L1 reading skills that might be potentially useful to L2 reading. Future research into this topic should consider using larger samples and more comprehensive assessment procedures than has been the norm in the past. Future research should also consider extending the range of rhetorical patterns studies beyond the four patterns looked at here. Longer texts which contain more varied patterns within each text might also be considered. Comparison among different language groups and the possible effects of how differing rhetorical organizations relate to the students' mother tongue offers considerable scope for future research. Such research will have clear practical applications for the teaching of reading comprehension.

## Notes

1. Further study by the author is planned using native English speakers reading the same texts.
2. See Kachru, 1997, for detailed arguments supporting the notion that western rhetorical styles are particularly difficult for other language groups.
3. See by Meyer (1985, p.48) for comments on the difficulties of scoring syntactically weak protocols.
4. Further details and supporting arguments for the research design used in this experiment can be found in Sharp, 2003, in press.
5. Schools in Hong Kong were at this time banded 1-5. Band 1 was considered to be the highest achieving in English language, Chinese and Mathematics.

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## **Appendix A: The texts used in the experiment**

### **Passage 1 (Description)**

Our bodies need a variety of foods to stay healthy. We may avoid bad health if we eat a variety of foods.

Protein is needed for children to grow healthily. Fibre provides a substance that helps prevent constipation. Vitamins can be obtained from fruit and vegetables. Protein is also important for good health. Energy levels will be reduced by a lack of carbohydrates. Vegetable fats are better for our health than animal fats. We should try to eat more vegetable fats. Carbohydrates can be found in foods such as bread, rice and potatoes. Protein can be found in eggs, fish and meat. Lack of vitamins can cause diseases such as rickets and scurvy. Eating vegetable fats rather than animal fats will reduce the risk of heart problems, particularly when we get older. We should avoid eating in McDonalds. Fibre can be found in cereals, vegetables and fruit.

### **Passage 2 (cause-effect)**

Our bodies need a variety of foods to stay healthy. A poor diet can cause disease.

If our bodies are provided with food that contains the right substances then we are less likely to become ill. A lack of vitamins can cause diseases like rickets and scurvy. Fruit and vegetables are necessary to avoid these diseases. A lack of protein can also result in illness, but this can be avoided by eating eggs, fish and meat. If we are able to eat plenty of carbohydrates then the body will be provided with the energy it needs. Carbohydrates can be found in foods like potatoes, bread and rice. Lack of fibre from foods like cereals, bread, vegetables and fruit are a cause of problems such as constipation. If we eat too much animal fat instead of vegetable fat then this may cause heart attacks, particularly when we get older. McDonalds restaurant food may be unhealthy because of high animal fats - we should eat there less.

### **Passage 3 (Listing)**

Our bodies need a variety of foods to stay healthy. Bad health can be helped if we follow the advice in the list below.

The first substance required for good health is vitamins, without them diseases such as rickets can occur. The second substance required for good health is protein and this can be obtained from fish, meat and eggs. The third substance we are going to consider is carbohydrates, these can improve our energy levels and are found in potatoes, vegetables and rice. The fourth substance is fibre. This can help constipation and can be found in cereals, bread, vegetables and fruit. Finally, mention should be made of animal and vegetable fats. Too much animal fat can cause heart problems, particularly when we get older. Eating vegetable fats means going to restaurants like McDonalds less if we want to stay healthy.

**Passage 4 (problem-solution)**

Our bodies need a variety of foods to stay healthy.

The problem of bad health may be solved if we eat a variety of foods. A lack of vitamins may cause illnesses like rickets or scurvy. A lack of protein will effect the growth of the body and a lack of carbohydrates will reduce energy levels. A shortage of fibre will cause problems like constipation. One food substance often mentioned is animal fats, these are a particular problem because they may cause heart attacks when we get older. The problems of eating too much animal fat when we go to restaurants like McDonalds is well known. The solution to these problems is to eat the right kind of food. Fish, meat and eggs provide protein. Eating potatoes, bread and rice will provide us with carbohydrates. Fibre can be found in such foods as cereals, bread, vegetables and fruit - these foods will prevent constipation. Eat more vegetable fats and go to McDonalds less to stay healthy.

**Appendix B: Sample Cloze****Description**

Our bodies need a variety of foods to stay healthy. We may avoid bad health if we eat a variety of foods.

Protein is needed for children to grow healthily. Fibre provides a substance that helps prevent constipation. Vitamins can be obtained from fruit and vegetables. Protein is also important for good health. Energy levels will be reduced by a lack of carbohydrates. Vegetable fats are better for our health than animal fats. We should try to eat more vegetable fats. Carbohydrates can be found in foods such as bread, rice and potatoes. Protein can be found in eggs, fish and meat. Lack of vitamins can cause diseases such as rickets and scurvy. Eating vegetable fats rather than animal fats will reduce the risk of heart attacks, particularly when we get older. We should avoid eating in McDonalds. Fibre can be found in cereals, vegetables and fruit.

Number of words: 147

Number of words in first sentence: 10

Number of noun phrases and conjoined phrases: 28

Procedure:  $147 - 10 = 137$  divided by  $28 = 4.89$ . Rounding up, the cloze is constructed by deleting every 5th word.

**Sample cloze based on 5th word deletion****Description**

Our bodies need a variety of foods to stay healthy. We may avoid bad 1. \_\_\_\_\_ (health) if we eat a 2. \_\_\_\_\_ (variety) of foods.

Protein is 3. \_\_\_\_\_ (needed) for children to grow 4. \_\_\_\_\_ (healthily). Fibre provides a substance 5. \_\_\_\_\_ (that) helps prevent constipation. Vitamins 6. \_\_\_\_\_ (can) be obtained from fruit 7. \_\_\_\_\_ (and) vegetables. Protein is also 8. \_\_\_\_\_ (important) for

good health. Energy 9. \_\_\_\_\_(levels) will be reduced by 10. \_\_\_\_\_(a) lack of carbohydrates. Vegetable 10. \_\_\_\_\_(fats) are better for our 11. \_\_\_\_\_(health) than animal fats. We 12. \_\_\_\_\_(should) try to eat more 13. \_\_\_\_\_(vegetable) fats. Carbohydrates can be 14. \_\_\_\_\_(found) in foods such as 15. \_\_\_\_\_(bread), rice and potatoes. Protein 16. \_\_\_\_\_(can) be found in eggs, 16 \_\_\_\_\_(fish) and meat. Lack 17. \_\_\_\_\_(of) vitamins can cause diseases such 18. \_\_\_\_\_(as) rickets and scurvy. Eating 19. \_\_\_\_\_(vegetable) fats rather than animal 20. \_\_\_\_\_(fats) will reduce the risk 21. \_\_\_\_\_(of) heart attacks, particularly when 22. \_\_\_\_\_(we) get older. We should 23. \_\_\_\_\_(avoid) eating in McDonalds. Fibre 24. \_\_\_\_\_(can) be found in cereals, 25 \_\_\_\_\_(vegetables) and fruit.

### Appendix C Sample templates, with pausal units and hierarchical arrangement indicated

#### Description: Text 1

Level of importance	Pausal /Idea Unit	Recall Total
3	Our bodies need a variety of foods to stay healthy.	
2	We may avoid bad health	
2	if we eat a variety of foods.	
3	Protein is needed for children to grow healthily.	
3	Fibre is a substance that helps prevent constipation.	
2	Vitamins are obtained from fruit	
1	and vegetables.*	
3	Protein is also important for good health.	
3	Energy levels will be reduced by a lack of carbohydrates.	
3	Vegetable fats are better for our health than animal fats.	
2	We should try to eat more vegetable fats.	
2	Carbohydrates can be found in foods	
1	such as bread	
1	rice	
1	and potatoes.	
1	Protein can be found in eggs,	
1	fish	
1	and meat.	
3	Lack of vitamins can cause diseases such as rickets and scurvy.	
3	Eating vegetable fats rather than animal fats will reduce the risk of heart problems.	
1	particularly when we get older.	
1	We should avoid eating in McDonalds.	
2	Fibre can be found in cereals,	
1	vegetables *	
1	and fruit	



Key to Importance Level rating: 3 = Main generalization. 2 = Supporting generalization.

1 = Supporting detail

\* repeated units not counted twice

Total number of units =

Number of units actually recalled =

Percentage recalled =

Importance total possible =

Total importance level actually scored =

Percentage importance score =

### **About the Author**

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