

# Reading Foreign Language Text – What Separates Skilled and Unskilled FL Readers?

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## Abstract

The research investigates how English speaking advanced learners of Japanese read an expository text in Japanese. Volunteer learners read the expository text in Japanese and recalled it in English. The study explored the differences between skilled and unskilled readers in their comprehension of this text. It examined how the readers retrieved the ideas (propositional) from the FL text and integrated them to form rhetorical units, and then linked these units into hierarchical relationships to build their comprehension of the text. It found that the rate of retrieval of the rhetorical units was a better indicator of overall comprehension than idea retrieval. Skilled learners' recalled a larger amount of not only the ideas but also rhetorical units in the text, and they comprehended the text better using priming and activating long term-working memory. The systematicities displayed by the skilled learners suggested that their reading comprehension processes may approximate those commonly observed among native speakers.

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## 1 Introduction

Good comprehension of a text demands a coherent representation of the text in memory. This representation consists of pieces of information from the text together with their interrelationships. In order to read expository text, readers must first have sufficient vocabulary knowledge to identify the words. They also need the lexical-grammatical knowledge to put the words together to recognise the ideas in the text, and these ideas into rhetorical units. Eventually, readers structure those rhetorical units into some cohesive message(s) by integrating their prior knowledge.

This particular study examines a case of advanced Foreign Language (FL) learners' text comprehension in FL. Analysing their written recall, it explores the learners' text comprehension at two different levels: how much information they have retrieved after reading the Japanese FL text, and how well they understood the text (i.e. integration of the ideas with the topic, author's intended messages). This study intends to explore and describe how good readers efficiently reconstructed the content of the expository text and how poor readers failed to do so.

## 2 Memory-based, constructionist reading comprehension models

Reading comprehension (word recognition and integration into sentences and hierarchical text) was once seen as a strong top-down schema (e.g. Bartlett, 1932; Schank & Abelson, 1977). However, more recently it has been regarded as a cognitive activity involving both bottom-up and top-down processes (e.g. Perfetti, 1999; Perfetti, Yang, & Schmalhofer, 2008). For example, in the Construction-Integration (CI) model, vocabulary is assigned a context particular meaning not by a

schema based discrimination process, but through a more sentence by sentence local process aided by knowledge in long term memory (LTM: Kintsch, 1998).

According to Kintsch (1998), text comprehension involves surface code, “textbase”, and “situated model” (Kintsch & Van Dijk, 1978). The textbase is a linguistic structure derived from the text (surface code), which is an ideal linguistic structure of the text. When a text is read, the textbase readers obtain from the text is often incomplete or incoherent. To comprehend the text (i.e. to obtain a coherent episodic memory of text: Kintsch, 1998), readers call upon their knowledge of topic, schema, emotion, goals, etc. These reader variations influence the construction of a situation model for the text.

Increasingly, the literature provides evidence that text comprehension can be seen as an interaction of the textbase and situation models (e.g. Roschelle & Greeno, 1987; Zwaan, Langston, & Graesser, 1995; Zwaan & Radvansky, 1998). To reiterate, the situation model reflects the integration of information from explicit linguistic expressions in the text and knowledge in memory, and it has been expanded to include non-linguistic cognitive processes in relation to linguistic (text) comprehension. For example, in the design of the research experiment, the similarities and dissimilarities between the task and other non-linguistic requirements influence the task results (e.g. mismatches between described action: linguistic information and required action: Glenberg & Kaschak, 2002; Kaup et al., 2006).

First of all, there is a written text (surface code). Readers need to recognise each word in the text and assign a meaning to it. This has been explained as visual stimuli going into working memory/short term memory (WM/STM) to be recognised as meaningful units (for example in Levelt, 1993 [first language: L1]; Huckin & Bloch, 1993 [second language: L2]). In working memory, these stimuli are built into words and each word is assigned meaning by utilising knowledge stored in the reader’s LTM, in which many nodes containing ideational meaning are networked with each other. The networks contain linguistic, semantic, pragmatic, social and cultural relationships. Meanings of the words are determined constantly using the text and context before and after those words (e.g. CI model: Kintsch, 1998; memory based constructivist text comprehension model: Perfetti, 1999; resonance process: Perfetti & Schmalhofer, 2007; Verhoeven & Perfetti, 2008).

Recognised words are also connected to form propositions. Propositions in a text become the microstructure of the text. Those propositions will be further linked together into units which hold rhetorical relationships between them (e.g. Meyer, 1985; Frederiksen, 1977), and at the same time those rhetorical units (the macrostructure of the text) will be placed in a hierarchical structure to obtain a coherent episodic memory of text (Kintsch, 1998).

As explained above, text comprehension happens by interaction of a text (textbase) and the reader (situation model). Textbase is created by the reader’s bottom-up construction of semantic meaning of the text and top-down syntactic integration of meaning into a hierarchical relationship. The bottom-up process starts with letter recognition, then to word recognition. Identified words will form propositions. Propositions will form microstructure (non-hierarchical sentence by sentence information) first. This microstructure is obtained by integration of and assistance from LTM (Kintsch, 1998). The microstructure will be arranged into a) rhetorical relationships and b) hierarchical in order to form the overall structure of the text. Seidlhofer (1995, p. 99) explains that the global structure of the text in the CI model is a combined product of macrostructure (van Dijk, 1980: semantic content of text) and superstructure (rhetorical organization). The macrostructure and superstructure consisting of semantic content and formal schemata, likely supplemented by the reader’s inferences, should ideally represent an overall structure of the text, i.e., textbase. However, comprehension of the text is what a reader actually remembers about the text, i.e., integrated outcomes of this textbase with the reader’s situation model consisting of his/her knowledge, schema, motivation, strategies etc.

Whereas Kintsch (i.e. CI model) pursues a comprehension model applicable for different genres including narratives and literatures, Meyer (1981, 1985) limits herself to prose analysis of expository text. She also identifies the “three primary levels of expository text” (Meyer, 1981; van

Dijk, 1979). Her three levels are similar to those of Kintsch (1998) but differ in emphasis. Meyer defines the first level as “ideas of text” (1985) which are propositions in term of case grammar (e.g. Fillmore, 1968), and thus it corresponds to microstructure above. The second level is defined as the gist of portions of text which hold logical relationships (Meyer, 1985, pp. 16–17) between: collocation; causation; response; comparison; and description. This level corresponds to macrostructure (Kintsch, 1998). The top level is an overall hierarchical structure built from rhetorical relationships created by the five logical categories.

Meyer (1985, p. 12) explains the difference between Kintsch’s and her approaches. Kintsch’s resultant hierarchical structures are built upon repeated words in text. Meyer’s hierarchy is bound by ideas and logical relationships. Thus, the superordinate nodes of each hierarchy can vary. Meyer’s superordinate nodes are defined logically and content is bound by top-structure, but Kintsch’s nodes are rather intuitive. Meyer adds that her approach is more effective for less accurate recalls such as by children and less proficient learners, and is suitable for studying the logic underlying learners’ expository text comprehension. For this study of language learners’ text comprehension, the author employs Meyer’s approach since the readers of the text in the study were foreign language learners. Compared to native speakers’ recall, the learners’ recall is generally less accurate due to their lack of knowledge and skills in their foreign language.

### 3 Foreign language learners and their FL text comprehension

Through the above cognitive processes, good readers will understand the text well by constructing an appropriate textbase and situation model within a reasonable timeframe.

This study explores learner comprehension of FL text. The bottom-up process by the FL learners may not be smooth due to their not-yet complete linguistic system of FL and insufficient experience in/with FL.

Unlike long term memory (LTM), the capability of working memory (WM) is constrained in time and capacity. When the learner lacks vocabulary and grammar knowledge, or prior experience/knowledge of the topic, he/she may not be able to comprehend some parts of the text due to running out of time for WM to synthesise the meaning of the text. The cognitive process of comprehension is unlikely to involve autonomous processes of perception/understanding, but more likely to involve problem solving and thinking “under conscious control and resource demanding” (Kintsch, 1998, p. 3).

At the microstructure level, lack of breadth of vocabulary knowledge likely forces learners to miss some propositions and lack of depth of vocabulary knowledge may cause them to form wrong propositions. They may also miss or wrongly form some propositions due to the constraints of WM. To form the macrostructure of the text, the learners are presumed to apply macrorules (van Dijk, 1980: deletion; generalisation; and construction) to the microstructure (Kintsch, 1998), or to bind the ideas expressed by the propositions into rhetorical units by establishing logical relationships between collocation; causation; response; comparison; and description (Meyer, 1985). Through this process, the learners may successfully approximate their macrostructure to that of the text.

For example, some learners might retrieve enough propositions to construct good macrostructure of the text, while other learners might retrieve insufficient propositions, but still be able to construct satisfactory macrostructure using appropriate inferences. In other cases, the learners who have retrieved enough propositions may deviate from the macrostructure of the text due to wrong inferences caused by their inadequate FL knowledge or interference from their L1 world knowledge. To comprehend an overall text, the learner builds a superstructure from macrostructure according to the hierarchical rhetorical relationships (Kintsch, 1998) or to achieve a top-structure by logically connecting the rhetorical units (Meyer, 1985).

The possible causes of text comprehension difficulty differ for each foreign and second language (FL/SL) learner, e.g., weak vocabulary, shortage of grammatical knowledge, lack of background knowledge, etc. Previous studies have looked into the idiosyncratic nature of the FL learners’ interlanguage in relation to reading comprehension. For example, lack of vocabulary knowl-

edge, which appears to be very closely related to reading comprehension in L1 (e.g. Laufer, 1997; Nation, 2006), also affected FL learners' L2 reading comprehension (e.g. Laufer, 1992; Mehrpour & Rahimi, 2010; Nation & Kyongho, 1995).

To fill the gaps created by unknown words, the learners may have to rely on their knowledge or schema (Brantmeier, 2003, 2005; Carrell, 1984a, 1984b) in addition to the context of the words (Kintsch, 1998; Perfetti, 1999; Perfetti & Schmalhofer, 2007; Verhoeven & Perfetti, 2008). Some learners may have poor ability to associate word meanings they identify with the larger context of the text (Perfetti et al., 2008).

Overall, in L2 (FL/SL) as well as in L1, reading comprehension requires both processing and storage of the incoming information from the text (Koda, 2004). WM capacity was found to be associated with adult reading skills (Daneman & Carpenter, 1980). Koda (2004) speculates that WM can likely play a major role to separate good readers from poor readers.

This study explores FL learners' text comprehension from another perspective: how the learners comprehend or not comprehend the text through memory-based constructive processes. The study examines the learners' written recall with the focus on the three levels of the comprehension process: 1) how much information each learner managed to retrieve from the text (identifying propositions in the text); 2) how well they networked pieces of information (propositions) to form logical rhetorical units to obtain the gist of the text; and 3) how well they constructed these logical rhetorical units into one hierarchical top structure to comprehend the overall text.

By comparing these three levels, we examine what separates skilled and unskilled learners.

## 4 Study

### 4.1 Participants

The participants of this study were twenty-eight English speaking learners who were enrolled in an advanced Japanese language course at tertiary level. They responded to an advertisement recruiting voluntary participation in classroom based research. After the purpose of the testing and the test procedures were explained to them both in writing and verbally, the participants were also asked to sign a consent form. Further explanation was provided for those participants who needed further clarification.

The participants' experience of Japanese language learning varied considerably. None of them had similar profiles. They had studied/used Japanese for five to twenty-one years. Most of them wished to use Japanese in their career. They were mostly satisfied with their achievement in Japanese (average 3.5 out of 5 degree scale varying 2.5 to 4). They thought script including *kanji* (Chinese character borrowed into Japanese: 75%) and grammar (50%) generally presented problems in their comprehension of Japanese sentences. Beyond sentence level, they indicated past difficulty with paragraphs and ideas (25%). Therefore their Japanese proficiencies were expected to vary to a certain extent, which is commonly observed in FL advance level class.

### 4.2 Method

#### 4.2.1 Task and procedure

The above 28 learner participants read an expository text in Japanese (FL). The participants were allowed to read at their own pace. Immediately afterwards, they were asked to recall what they understood from the text in their L1. The reason they were asked to recall in L1, but not in FL, was two-fold. Firstly they were advanced learners so they might have been able to recall some Japanese words/sentences without comprehension if asked to recall in FL. Secondly, they may not be able to reproduce words/sentences they understood correctly in Japanese due to difficulty reproducing unfamiliar characters if writing or pronunciation (*kanji* can be understood without pronunciation) if speaking. The participants' written recall was typed out and qualitatively analysed.

#### 4.2.2 The reading passage

The passage was chosen from among text materials for advanced learners (from Sasaki & Kadokura, 1991: “Japanese society, an update”) with consideration of the level of difficulty, the topic (cashless society) and the length (661 characters). The text was moderately difficult for the participants<sup>1</sup>, so that we can see a spread of the participants’ reading comprehension. The text topic was familiar to anyone since we are living in cashless society. Thus we could avoid large variations of previous knowledge of the topic among the participants. The length was reasonably short (661 characters) and the participants did not take much time to read and could recall the entire content without problem.

Prior to the study, the Japanese text was translated into English by two bilinguals, a Japanese and an English native speaker. For the purpose of the study, the English translation reflected as closely as possible the original sentence structures and paragraphs of the Japanese text, and any differences in their translation were resolved by discussion.

Then the translated text was analysed into 1) idea units (propositions: case grammar: e.g. Bo-vair & Kieras, 1985; Cook, 1989), and 2) rhetorical units in a hierarchical structure according to the rhetorical relationships among the units (prose analysis: Meyer, 1985, 1975) prior to asking the participants to read the text.

The text was also organised into a hierarchical structure by using Meyer’s four rhetorical relationships, i.e. Description, Causation, Response (problem/solution), and Comparison (Carrell, 1984a; Meyer, 1975, 1985). The text included Description, Causation and Comparison (but not problem/solution) relationships, and seven levels were found among the rhetorical units in a hierarchical structure. The units were given seven to one points each from the highest to the lowest level in the hierarchy.

The following are examples of the relationships included in the text:

- 1) Collection of description (description: evidence: equivalents)
  - Salaries are automatically paid into bank account
  - shopping is done by cards, and
  - monthly expenses are directly debited from our account.
- 2) Causation (covariance: antecedent and consequent)
  - When money was left over (covariance-antecedent),
  - it became ‘saving in drawer’ (*hesokuri*) (covariance-consequent: equivalent), and
  - provided housewives with pleasure of having secret (stash of) money (covariance-consequent: equivalent).
- 3) Comparison (adversative/time)
  - These days we don’t carry cash
  - It was some twenty years ago that ....

#### 4.2.3 Analysis

The 28 participants’ written recall was typed out and scored by two raters. Firstly the ideas retrieved from the text were quantified by giving one score to each proposition in the text the participants retrieved in their written recall. Secondly the amount of rhetorical unit retrieval from the text was measured by giving one score to each unit recalled by the participants. The participants’ text comprehension was measured by giving weighted scores, one to seven points, to each rhetorical unit, according to its position in the hierarchical text structure, i.e., top structure was seven and bottom was one point. Any disagreements between the raters were either resolved by discussion or referred to a third rater to finalise the scores (inter-rater reliability co-efficient:  $\alpha = .95$ ).

5 Results

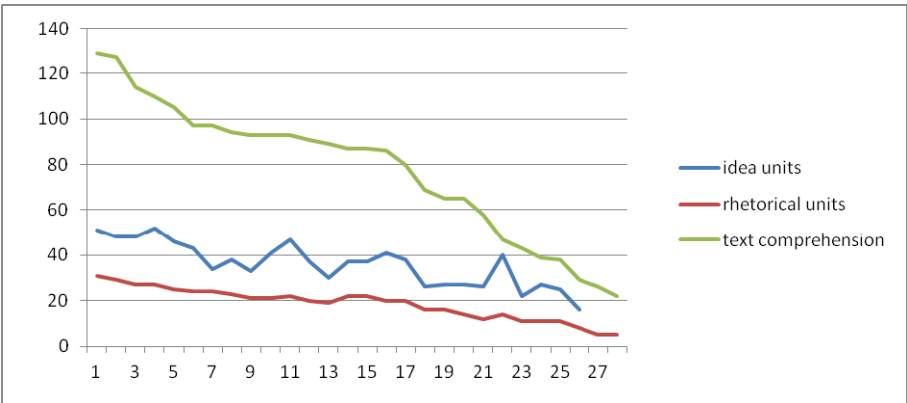
The participants’ performance in text reading was more varied than similar as seen below.

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Idea units	27*	36	16	52	35.67	9.652
Rhetorical units	28	26	5	31	18.57	7.015
Text comprehension	28	105	22	127	75.64	30.067

\* Since one subject (P-1 in Table 3) reported her judgment of the text or her conjectures rather than what the text was about, her recall is excluded here.

**Table 1: Combined group performance at idea and rhetorical unit retrieval, and overall comprehension**

However, overall, the more idea units the participants retrieved from the text, the more rhetorical units they obtained and the higher the rhetorical structures they recalled. In other words, the more ideas the learners could retrieve from the FL text, the better gist of the text they obtained, and that eventually led the learners to better comprehension of the text. The higher correlation between rhetorical units and text comprehension rates suggests that the rhetorical units in higher positions of the hierarchical overall text structure were more likely remembered than lower ones (Figure 1).



Horizontal numbers represent 1 as 1-P, 2 as 2-P etc. in Table 3.

**Figure 1: Idea and rhetorical unit retrieval and text comprehension**

		N	Correlation	Sig.
Pair 1	Idea & Rhetorical unit retrieval	27	.875	.000
Pair 2	Rhetorical units & Text comprehension	28	.979	.000
Pair 3	Idea unit retrieval & Text comprehension	27	.838	.000

**Table 2: Paired group performance correlations**

To examine further characteristics of the participants’ reading comprehension, the participants were grouped according to their comprehension rate (see Table 1). The participant who rated closest to the mean score of the participant group was used as the base line for the Fair group (P-10: Idea 38; R-units, 20; R-st, 80). The participants in the Fair group were further divided into two subgroups for those who comprehended 55–64% and others who comprehended 65–74% of the text. The participants who comprehended the text better than the Fair group were categorized into

Good (above 75% and below 90%) and Excellent (above 90%) subgroups. The participants who comprehended less than the Fair group were separated into Weak (40–54%) and Poor (less than 35%) subgroups.

Sub-groups	Demarcation	Subjects
<b>Excellent readers</b>	Recall demonstrated above 90% of the text was comprehended appropriately	<b>P-17 , P-7</b>
<b>Good readers</b>	Recall demonstrated above 75% of the text was comprehended appropriately	<b>P-27, P-21, P-4</b>
<b>Fair readers</b>	Recall demonstrated above 65% of the text was comprehended appropriately	<b>P-8, P-18, P-19, P-20, P-15, P-14, P-3,</b>
	Recall demonstrated above 55 % of the text was comprehended appropriately	<b>P-23 , P-6, P-13, P-16, P-10</b>
<b>Weak readers</b>	Recall demonstrated above 40 % of the text was comprehended appropriately	<b>P-22, P-2, P-11, P-28,</b>
<b>Poor readers</b>	Recall demonstrated less than 35 % of the text was comprehended appropriately	<b>P-9, P-24, P-12, P-5, P-26, P-1, P-25</b>

**Table 3: Subgroups of the subjects**

The cohort displayed the following characteristics overall.

- CO-1) Excellent, Good, and Fair readers (Table 3) recalled rhetorical units (R-units) at higher rates than idea units (I-units). Among Poor readers, some (P-12, P-5, P-26 in Table 3) had lower scores for R-units than I-units and others had higher.
- CO-2) Half of the Excellent, Good, and Fair readers' comprehension rates were higher than their retrieval rates of R-units (45.8%), and the other half had the reverse. All Poor readers' comprehension rates were lower than those for their R-units.
- CO-3) R-units recalled by the cohort had the following characteristics:  
 The units most recalled (above 70%) were those that
  - RU-1) can stand alone without units before and/or after;
  - RU-2) can be read without any previous knowledge;
  - RU-3) are positioned from the top to the third level (out of 7 levels) in the hierarchical structure
  - RU-4) consist of core parts of the text (without them the entire text message was not retrievable); and
  - RU-5) the top three were located close to the end of the text.
 The units least recalled (below 30%) were those
  - RU-6) at the fourth level and below;
  - RU-7) various types: an embedded explanation for a sentence subject, a restatement of something just said, one demonstrative;
  - RU-8) consisting of minor parts of the text (without them the entire text message was retrievable); and
  - RU-9) in the middle of the text (neither the beginning nor the end of the text).

The above Excellent (above 90% understanding of the text), Good (90–75%), Fair (75–55%), Weak (55–40%) and Poor (less than 35%) reader groups were further identified as Skilled (the Excellent and Good groups combined: above 75% understanding of the text), Unskilled group (the Poor group: less than 35%), and the neither. When the Skilled and Unskilled readers were compared, the following similarities/ differences were observed:

- SU-1) Neither the Skilled or the Unskilled group displayed any strong correlation between I-unit retrieval and Text comprehension ( $r = .309$  for skilled and  $r = .538$  for un-

- skilled) but there were high correlations between R-unit unit retrieval and T-comprehension for both groups ( $r = .955$  for skilled and  $r = .971$  for unskilled).
- SU-2) The Skilled readers recalled R-units well overall. The missing units were not clustered at any particular location in the text. The Unskilled readers missed a large part in the middle of the text and remembered just the very beginning and towards the end.
- SU-3) All Skilled readers' T-comprehension and recalled R-unit retrieval rates were much larger than that of I-units (the average: I-units 66.2%; R-units: 84.2%; T-comprehension: 83.6%). The Unskilled readers' T-comprehension and recalled R-unit retrieval rates were similar or less of than that of I-units (the average: I-units 35.1%; R-units: 28.1%; T-comprehension: 24.9%);

The Skilled readers recalled a much larger proportion of R-units, and several common features were found in addition to those above:

- Sk-1) half of the R-units were commonly recalled by all;
- Sk-2) the recalled units were spread throughout the text;
- Sk-3) 75% of the T-comprehension (weighted rhetorical units) was shared by 80% of Skilled readers;
- Sk-4) the types of R-units included all three types of relationship included in the text (description, causation, and comparison);
- Sk-5) the commonly comprehended portion of the text by the Skilled readers (Sh-3) consisted of the following R-units:

Type of the unit	Nature of the unit	No.	Total
Comparison	time	2	2
Description	evidence	2	10
	specific	4	
	attribute	3	
	explanation	1	
Causation	antecedent	6	12
	consequent	6	

**Table 4: Skilled readers' recall of rhetorical units/structures**

- The Unskilled readers' recall did not indicate much commonality:
- USk-1) none of the R-units was recalled by all the Unskilled readers;
  - USk-2) the most recalled R-unit (85.6%) was a description (explanation) unit; and 19% of the T-comprehension (weighted rhetorical units) was recalled by 57% of the Unskilled readers;
  - USk-3) the recalled units were clustered at the beginning and towards the end of the text;
  - USk-4) the commonly comprehended portion of the text by the Unskilled readers (19%) included all three types of relationship (description, causation, and comparison).



Type of the unit	Nature of the unit	No	Total
Comparison	time	1	1
Description	evidence	1	4
	specific	1	
	attribute	1	
	explanation	1	
Causation	antecedent	1	2
	consequent	1	

**Table 5: Unskilled readers' recall of rhetorical units/structures**

A closer look at the rhetorical units recalled by Skilled and Unskilled readers indicated:

- T-1) Skilled readers appeared to have established the following continuous word associations (semantic linkages) in the text they recalled.
- i) (don't carry) cash → salaries → shopping, (card) → salaries, (figures) → spending (through) shopping, (figures) [this part is equivalent to the first part of a Japanese four-part text structure: 起 (*ki*)]<sup>2</sup>
  - ii) spend (money) → money → money (was left) → (secret) money [this part is roughly equivalent to the second part: 承 (*shoo*)]
  - iii) (turn into) figures, (cash) → finance → numbers → (change from) analog (into) digital → numbers [this part is an analogy and roughly equivalent to: 転 (*ten*)]
  - iv) money → figures → shopping → balance → overdraft → bill, shopping → bills [this part is equivalent to 結 (*ketsu*)]
- T-2) Unskilled readers, on the other hand, tend to have very few and less developed associations
- i) (don't carry) cash → (missing) → shopping, (card) → (missing)
  - ii) (missing)
  - iii) (missing)
  - iv) (missing) → shopping → card → overdraft → bills, shopping → bills

All participants were interviewed immediately after the recall. None of them mentioned awareness of the *ki-shoo-ten-ketsu* structure of the text.

## 6 Discussion

The first research question concerned the relationships between ideas retrieved from the text and reading comprehension. In this study idea retrieval was counted by the number of propositions retrieved from the text. Reading comprehension was measured by how well the macro-propositions (rhetorical units) were constructed into a hierarchical rhetorical structure to represent the original text.

The findings indicate that 1) the more ideas retrieved, the more rhetorical units will be correctly formed ( $r = .875$ ). When the readers managed to establish rhetorical units, those units are likely in the higher positions of the rhetorical tree structure ( $r = .979$ ). Thus, the more vocabulary readers know, the more text they can understand, the more propositions they can retrieve from the text, and the better the chance they will understand the text. This confirms that a bottom up process is at work during comprehension.

The second question was what types of rhetorical units (macro-proposition) were easier or harder to retrieve than others. Rhetorical units the cohort more easily recalled can be summarised as stand-alone units (RU-1), higher in the hierarchical structure of the text (RU-2) and consisting of the core parts of the text (RU-4), and located towards the end of the text (RU-5). On the other hand, the harder to recall units were lower in the hierarchical structure of the text (RU-6), non-core (RU-7, -8) and located in the middle of the text.

Stand alone units are easier to encode since they don't necessarily require sequential processing of units. Similarly, units towards the end of the text require less integration/processing than those in the middle of the text. When reading text, readers make decisions about which parts of the text are important and which can be ignored. Therefore, the readers pay more attention and time on important units (level effects in recall: e.g. Kintsch, 1974; Meyer, 1975). Consequently, less important units might not be encoded.

The last question was what separated skilled learners from unskilled learners. As a whole group, the participants' reading comprehension correlated strongly to the number of rhetorical and idea units they retrieved from the text. In other words, the more the text was recalled the more likely it was comprehended. However, when the skilled and unskilled groups were compared, both groups' rate of rhetorical unit recall correlated with their text comprehension strongly and significantly but their idea unit recall did not (SU-1). Furthermore, the skilled readers recalled the text content overall, the unskilled readers' recall of the text content was skewed more toward the beginning and end of the text (SU-2). Thus, the skilled readers read more efficiently by integrating propositions more effectively into rhetorical unit recalls (CO-1), and recalling rhetorical units at higher positions in the text structure (SU-3, CO-2).

The above may be explained with the Construction-Integration (CI) model. The unskilled readers tended not to integrate ideas, due to the capacity limits of short term memory. The isolated individual ideas could not trigger related elements in long term memory (Kintsch, 1998). Thus, they were unable to construct a CI model (textbase + situation model) to obtain a cohesive mental representation, i.e., comprehension of the text. Or, simply because the unskilled readers lacked linguistic or other knowledge in retrieving each proposition, there was not enough textbase to understand the text.

When the skilled readers' rhetorical unit retrieval was compared to that of unskilled readers, the two groups displayed distinctively different patterns. The readers in the skilled group recalled a large number of the same rhetorical units (half by all: Sk-1; 75% by 80% of the readers: Sk-3), which were located throughout the text (Sk-2) and included the three types of rhetorical units (comparison, description, and causation). The unskilled readers recalled hardly any common units (USk-1, -2) and common units recalled were clustered at the beginning and towards the end of the text. The rhetorical units/structures the Skilled readers recalled (refer to T-1 in the previous section: Results) might suggest that priming (effects of prior activation or activation of LTM: Kintsch, 1998) is at work in their understanding the text (e.g., T-1: i) salaries → shopping → salaries → spending (through) shopping). In contrast such priming was hardly seen among the Unskilled readers (T-2).

Then, what actually separated skilled learners from unskilled learners in this study? The above findings may suggest that certain systematicities and variations among the Skilled learners possibly approximate those of native speakers. The Unskilled learners' idiosyncrasies seem to be particular to these foreign language learners. Being FL learners, their systems in FL are not like those of native speakers and are both individually and collectively idiosyncratic. They lack vocabulary knowledge and linguistic knowledge in FL, and so their textbases may be far from ideal. Their situation models can be affected by lack of language and cultural experience in FL. Their prior knowledge of the text topic can be quite different from that of native speakers.

Thus, unskilled learners' mental representations can be quite idiosyncratic, even at the advanced level as we have seen above. Some learners' memories of the text were incomplete and missing information (ideas and events). Some learners achieved an optimal text comprehension resulting from integration of balanced textbase and situation model (a good CI model). Lacking factual knowledge, some learners' memories of the text were dominated by their situation model, which did not necessarily coincide with the text content. However, as the learners' FL advances, their text comprehension should demonstrate some commonalities and systematicities with that of native speakers.

## 7 Conclusion

This study explored the FL text comprehension of English speaking advanced learners of Japanese<sup>3</sup>. It examined how the advanced learners' recall written text to investigate how they come to comprehend or not comprehend the FL text using a memory based, construction-integration framework. The processes this study examined occur regardless of the task requirement for or objectives of reading the text. The reader is required to identify letters, words and ideas from the visual written text to start with, and to build a coherent episodic memory of the text (Kintsch, 1998) in order to understand it.

The study examined the text comprehension processes at three different levels: idea retrieval, rhetorical unit construction, and overall comprehension of the text. The findings can be summarised as follows:

- 1) The rate of reconstruction of the rhetorical units was a better indicator of overall comprehension than idea (propositional) retrieval;
- 2) This also suggests that the learners are making decisions to keep some ideas in their LT-WM and ignore others (macrorules were applied while reading the text).
- 3) Skilled learners appear to display fewer idiosyncrasies than the unskilled learners.
- 4) Thus, this research also supports Interlanguage theory that there might be some systematicities in the reading comprehension processes of skilled learners which probably approximate to those commonly observed among native speakers.

The study also shed light on the FL learners' text comprehension processes from a macro view point. The unskilled learners failed to achieve a coherent mental representation of the text, due to insufficient textbase and possibly an inappropriate situation model, lack of prior FL knowledge and experience and/or interference from L1. Closer examination of their text comprehension, such as why some rhetorical units are encoded but not others, will provide further understanding of learners' text comprehension.

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## Notes

<sup>1</sup> The text difficulty level was determined by examining texts the learners had previously studied.

<sup>2</sup> “*Ki-shoo-ten-ketsu*” (起承転結) is a four-part organisation principle Japanese text uses, originating from Chinese four-lined poetry. *Ki*: presenting topic at the beginning; *Shoo*: developing the topic further; *Ten*: surprise turn (indirectly relevant to, and related to the topic); *Ketsu*: bringing all together and reaching a conclusion. (Maynard, 1998). However, the Japanese text in this study is a part taken from an essay so does not strictly follow the above principle, and the researcher had to change the end slightly for the part to stand alone.

<sup>3</sup> In this study, the participants were deemed to be advanced learners as they were studying in or had completed advanced level tertiary classes. They were not screened by proficiency tests for this study.

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