

Reassessing Readers' Comprehension Monitoring

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Abstract

For the past three decades, most metacognitive studies in the research field of reading have focused on how metacognition functions best in specific, successful strategies, instead of investigating how comprehension monitoring can be developed. This results in knowing what metacognitive strategies to use and how they are used, but still does not account for their successful and automatic utilization. The internalization of metacognitive competency therefore seems to deserve further investigation. The present study aims at reassessing both proficient and less-proficient readers' comprehension monitoring. The findings of this study show, first of all, that proficient readers displayed more competency in monitoring their on-going thinking process since they tended to monitor their reading process all the time in order to compensate for words that had not been previously decoded. Secondly, the proficient readers employed higher levels of comprehension monitoring which included internal and external consistency (Baker, 1985, 1996). Thirdly, comprehension monitoring can be developed by interaction with a knowledgeable person. Teacher intervention enhanced the less-proficient readers' development of comprehension monitoring by providing them with basic language knowledge as a resource for comprehension monitoring and integrating sporadic information. Finally, the present study suggests that comprehension monitoring is no less significant than reading strategies. Comprehension monitoring can only become possible when there is something available to be monitored (Perfetti, Maureen, & Foltz, 1996). Instruction of basic language knowledge, therefore, should come before that of comprehension monitoring.

Keywords: comprehension monitoring, metacognitive strategies, reading processes, compensation

Introduction

From bottom-up theories and top-down theories to the more recent interactive models, researchers have argued about which reading model is best to explain the process of readers' comprehension. Reading comprehension traditionally refers to a reader's complete understanding or full grasp of meanings in a text. However, this broad definition results in some confusion when different levels of comprehension cannot be appropriately identified and explained. In fact, Scovel (1998) stated, "comprehension is not an absolute state where language users either fully comprehend or are left completely in the dark" (p. 59). Rather, comprehension involves an

active, dynamic, and growing process of searching for interrelationships in a text. Comprehension better refers to readers' understanding of propositions -- the basic units of meaning -- in the text. The propositions include words, phrases, sentences, and paragraphs. Therefore, as long as the reader understands the meaning of a certain proposition, he/she is said to be involved in comprehension. Since the propositions consist of words, sentences, or paragraphs, readers' cognitive levels of comprehension can be graded based on these propositions. That is, one person might only engage in lexical comprehension (words), while another may get involved in syntactic comprehension (sentences), the level of which is obviously higher than the former.

In addition to the explanations of the reading comprehension process based on reading models, researchers have also categorized a lot of so-called "good" reading strategies that "should be adopted" to enhance readers' comprehension of texts. However, even being equipped with a variety of reading strategies, readers still need a higher-level ability to utilize their reading strategies. This ability is what we call "comprehension monitoring": the ability to know what has been done right or wrong and to integrate new information with prior existing knowledge.

The terms "*metacognition*" and "*comprehension monitoring*" are commonly used interchangeably. However, the term "*comprehension monitoring*" adopted in this study should not be confused with "*metacognitive strategies*" or "*comprehension monitoring strategies*." The latter two terms are used to classify the scope of specific strategies that can be employed by readers in order to comprehend the meaning beyond texts. Rather than a skill or strategy, comprehension monitoring might be better defined as a general "competence," "control," or "status" that exists internally in one's mind. If a reader does not possess a generalized comprehension monitoring competency, it seems to be impossible for him/her to utilize specific metacognitive or comprehension monitoring strategies. According to Block (1992), metacognition is "an ability that develops relatively late because it involves the ability to stand back and observe oneself" (p. 320).

Unlike other competencies required in reading, such as knowledge of vocabulary and grammar, comprehension monitoring is not something that can be obtained through rote-memorization, drilling, or the teacher's one-way instruction. Instead, interaction between the teacher and students seems to provide the best opportunities for developing the competency of comprehension monitoring. Payne (1992) who investigated the effects of comprehension monitoring on basal readers' reading comprehension indicated that initially the classroom teacher took a directive role in explaining the reading process, modeling mental processes, and providing guided practice; but gradually, students learned to perform the steps independently while reading. This discloses the significance of teacher intervention in developing students' competency in comprehension monitoring.

Comprehension monitoring competency is particularly crucial to foreign language (L2) readers. Since L2 readers have a more limited knowledge of vocabulary and grammar and have to decode meanings of texts by adopting strategies, they also need comprehension monitoring to further examine whether the strategies have successfully overcome their reading problems. Block (1992) indicated that most research related to comprehension monitoring has been conducted with native English speakers. She claimed, though, that comprehension monitoring is more important

for L2 readers, as they will probably encounter more linguistic difficulties than L1 (native speaker) readers do and thus need to "repair more gaps in their understanding" through comprehension monitoring (p. 320). Block argued that more studies should be done on L2 readers.

If repairing more gaps by monitoring one's comprehension process is necessary for L2 readers, then it is undoubtedly so for English as a foreign language (EFL) readers whose language environment is more confined and who are therefore likely to encounter more linguistic obstacles. Unfortunately, the development of comprehension monitoring in EFL students still receives little attention. The present study, thus, is to investigate how EFL students' comprehension monitoring can be initiated and developed through teacher intervention. The research questions are

1. How does comprehension monitoring occur in proficient and less-proficient readers' reading processes?
2. In which ways do proficient readers perform comprehension monitoring differently from less-proficient readers?
3. How does teacher intervention affect proficient and less-proficient readers' development of comprehension monitoring?

Comprehension Monitoring

From the first examinations of reading strategies, researchers have tried to distinguish "good" strategies from "bad" ones with the intention of training less-proficient readers to use "good" strategies as they read (Block, 1986; Devine, 1984; Hosenfeld, 1977). However, Sarig (1987) pointed out that good strategies do not necessarily lead to successful comprehension. Anderson (1991) claimed that proficient and less-proficient readers might actually use the same strategies. This uncovered the fact that reading strategies alone cannot account for the effectiveness of reading comprehension. Being aware of this flaw, researchers then started to conduct studies related to comprehension monitoring.

Brown (1980) viewed metacognition as "the deliberate conscious control of one's own cognitive action" (p. 453). Brown, Armbruster, and Baker (1986) further suggested two types of metacognitive activities: those concerning one's knowledge about one's own cognitive resources, and those regulating and modifying the progress of a specific cognitive activity. To be effective, Brown et al. claimed that readers have to be aware of and be able to control the cognitive activities they are engaged in as they read. Baker (1996) further suggested a framework that readers could use to evaluate their understanding of the texts. The seven standards in her framework are 1) the *lexical standard*, 2) the *syntactic standard*, 3) the *internal consistency standard*, 4) the *external consistency standard*; 5) the *cohesiveness propositional standard*, 6) the *structural cohesiveness standard*, and 7) the *informational completeness standard*.

In summary, while studying how metacognition can function most effectively, instead of investigating how metacognition could be developed generally, most researchers have suggested

a lot of activities to train readers to be equipped with metacognitive reading strategies specifically. It cannot be denied that this strategic training serves as a very concrete channel to access metacognition; however, knowing what strategies to use and how to use them still does not account for the successful and automatic utilization of metacognition. Thus, the internalization of a general metacognition competency seems to need further research.

Proficient vs. Less-Proficient Readers' Comprehension Monitoring

While expert readers usually plan, predict outcomes, and monitor their performance, novice readers are found to be less sensitive to inconsistencies in their reading processes. Zabucky and Ratner (1989) indicated that good readers tend to detect inconsistencies in reading and usually look back at and recall those text inconsistencies; however, poor readers seem to lack this capability.

Ehrlich, Remond and Tardieu (1999) investigated the differences in metacognitive monitoring between young skilled and less-skilled comprehenders. They found that less-proficient readers lack cohesion in the tasks of inconsistency detection. Craig and Yore (1995) and Persson (1994) seem to distinguish proficient readers from less-proficient ones based on their competency in comprehension monitoring. However, they concluded, whether it is the lack of comprehension monitoring alone that leads to unskilled readers' failures in understanding texts, or if there are other factors attributing comprehension failures, requires further investigation.

Perfetti, Marron, and Foltz (1996) point out that "comprehension cannot be monitored or evaluated if no comprehension has taken place" (p. 144) and suggest that lexical knowledge should be reconsidered as an important source of comprehension failure. This discloses the fact that competency of comprehension monitoring could only serve as a sufficient element, rather than an absolute one, to determine whether readers could succeed in reading comprehension texts.

L1 and L2 Readers' Comprehension Monitoring

Since L2 readers have more limited linguistic knowledge than L1 readers do, whether insufficient language knowledge influences L2 learners' comprehension monitoring process has become a critical issue. Block (1992) conducted a famous study concerning the comprehension monitoring of L1 and L2 readers. By observing four groups (proficient native readers, proficient ESL readers, less proficient native readers, and less proficient ESL readers), he investigated how L1 and L2 readers performed when monitoring referent and vocabulary problems. There were two primary findings relevant to the present study.

First, when monitoring a referent problem, proficient L2 readers were found to engage in comprehension monitoring processes as completely as proficient L1 readers did. Likewise, both less proficient L1 and L2 readers were more likely to fail to recognize that a problem existed or identify the source and solve the problem. Reading proficiency therefore seems clearly to be a factor in determining the success of readers' comprehension monitoring processes.

Secondly, when monitoring a vocabulary problem, both proficient L1 and L2 readers carried out

the comprehension monitoring in the same way as they did when monitoring a referent problem. In addition, they seemed to be less disturbed by the difficult words and tended to understand the texts' overall meaning. Although both less proficient L1 and L2 readers were aware of the sources of problems, they failed to identify the means to solve problems. Block concluded that differences in the effectiveness of comprehension monitoring between the four groups lay in their reading proficiency, rather than their language background.

For years, many researchers have well investigated proficient and less-proficient readers' different performances in comprehension monitoring by partially requesting readers to detect certain problems in a text. However, how comprehension monitoring functions throughout the whole on-going thinking process in a reader's mind remains unexamined, the issue of which deserves more discussion.

Method

Subjects

The participants of the study were recruited from the freshmen English classes at the Department of Business Management and the Department of Space Design in National Yunlin University of Science and Technology; the numbers of freshmen in each class were 54 and 42, respectively. The mean scores in the mid-term and final *Reading* exams were the referential criteria for selecting subjects. The top 14% of the students (Chen, 2000) in the referential criteria of each class were considered as proficient readers, and the lowest 14% of the students of each class as less-proficient readers. Six subjects, 3 from the Department of Business Management and 3 from the Department of Space Design, were chosen by random selection from each reading ability group (proficient and less-proficient) to participate in the present study, for a total of twelve students. A profile of the twelve subjects is presented in Table 1.

Table 1: *Subjects' Profiles*¹

Less-Proficient Readers

Subject	Major	Mid-Term Score	Final Exam Score	Mean (S. D.)
Student A	Space Design	67	51	59 (8)
Student B	Space Design	54	56	55 (1)
Student C	Space Design	49	56	52.5 (3.5)
Student D	Business Management	72	44	58 (14)
Student E	Business Management	62	50	56 (6)
Student F	Business Management	40	85	62.5 (22.5)

Proficient Readers

Subject	Major	Mid-Term Score	Final Exam Score	Mean (S. D.)
Student G	Space Design	86	83	84.5 (2)

Student H	Space Design	72	87	79.5 (7.5)
Student I	Space Design	82	77	79.5 (5.59)
Student J	Business Management	83	93	88 (5)
Student K	Business Management	88	89	88.5 (0.5)
Student L	Business Management	89	90	89.5 (0.5)

Materials

The texts considered for selection were from the commonly used college-level textbooks in Taiwan such as *Reader's Choice* (Baudoin, Bober, Clarke, Dobson, & Silberstein, 1991), *Project Achievement: Reading* (Spache & Spache, 1982), *Interactions One* (Kirn & Hartmann, 1996), and *English Reading Collection for College Students* (Chuang, 1996). The English teachers of each class were asked to select the passages: They were asked to choose texts at the first-year level of college reading that their students had never read before. The passages chosen by these two teachers were then used for this study. The total number of words for the training text, selected from *English Reading Collection for College Students* (Chuang, 1996), is 179, and the average length per sentence is 19.9 words, as shown in Appendix A. The total words for the text used in the experiment, adapted from *English Reading Collection for College Students*, is 198, and the average length per sentence is 22 words, as shown in Appendix A.

Procedure for Data Collection

This study was conducted in the spring semester of 2001 and included two consecutive stages: a think-aloud procedure, and a diagnostic and remedial procedure. All participants were met individually by the experimenter (the teacher) in each of the two stages, in a small classroom. They were informed that their verbal reports would be recorded and transcribed. Because reporting in a foreign language (English) would probably increase the cognitive load of the task, all participants in this study were allowed to report in their native language, or a combination of native and foreign languages (Cheng, 1998). However, for convenience in reporting the research results, the subjects' protocols have been translated, and are given in English.

In the first think-aloud procedure, each subject was given a formal introduction to the think-aloud method. To encourage subjects to report their comprehension processes as much as possible, training in the think-aloud method is important (Lin, 1996). After the subjects understood the think-aloud procedure, they were given a text for training. In essence, the training was a warm-up practice for the formal data collection session.

Five days after the think-aloud training task for all subjects, the formal experimental session began, and the new text was used for the first time. In the first experimental think-aloud procedure, the subject was asked to think aloud when reading the assigned text. The experimenter, acting as a guide, sat beside the subject. If the subject kept silent for a long period of time or was stuck in interpreting the meaning of a sentence, the experimenter prompted him or her to describe his or her thoughts by asking such questions as "What are you thinking?", "Why have you stopped here?", "Which sentence are you reading?", and so forth. The role of the

experimenter was not to provide explanations for the text but to act as a counselor and to encourage and lead the subject to continue and complete the think-aloud procedure.

If the experimenter's intervention succeeded in helping the subject to describe their thoughts, he/she was allowed to go directly to the succeeding sentences. If the intervention did not work, the experimenter tried different ways to invoke a verbal report such as "*What would you interpret if you read the whole sentence?*" and "*Could you speak a little bit louder?*" The frequency and time of the experimenter's interventions varied greatly depending on the needs and reading experiences of each subject. Some of the subjects would actively ask the intervention of the experimenter, while others not at all. At the end of the first session, the subjects were requested to answer multiple-choice test items without referring to the text.

Five days after the transcriptions of the 12 subjects' verbal reports were completed, the diagnostic and remedial experiment began. In this second procedure, each subject was requested to read and evaluate their own first-time transcripts. That is, the subjects read and examined the transcripts of their own verbal reports to see if they felt that there was anything needed to be confirmed, rejected, modified, or corrected. Each subject's diagnostic and remedial procedure was also recorded and transcribed.

Data Analysis

The present study aims to analyze how readers have monitored their comprehension processes and how teacher intervention has provided facilitation. Seven levels of cognitive process in comprehension monitoring are identified (Baker, 1996, p. 341). Subjects' protocols were analyzed by the researcher based on these seven levels of comprehension monitoring. In order to examine the accuracy of standard levels and protocol analysis, another rater who had taken graduate courses on protocol analysis was invited to classify standard levels as well as to conduct protocol analysis for each subject. The interrater reliability was 0.83. Differences in classifying standard levels and examining protocols were resolved through discussion. An example of each standard, taken from the 12 subjects, is presented here:

Lexical standard. The reader checks whether the meaning of each word is understood. For example, Student L said,

(Text) "...decide..."

*(Romanized Chinese)*² "decide...shi4she2mo5...jue2ding4 ma1?"

(Back Translation) "decide...what's it? Determine?"

Syntactic standard. The reader evaluates the grammaticality of a sentence or phrase. For instance, when interpreting the meaning of the sentence which begins, "However, it is not easy since there have been many changes in custody..." which was not explained in the first-time think-aloud procedure, she decoded its meaning as the following based on the sentence's grammar and structure.

(Text) "...this is not easy, since there have been many changes in custody arrangements through the years"

(Romanized Chinese) "..zhe4 bu1shi4 rung1yi4 de5 shi4qing2, zi4cung2...zai4...zai4 zhe4ji2nian2 de5 jian1hu4quan2 wen4ti1 you2 xu2duo1 gai2bian..."

(Back Translation) "..This is not easy since....during these years there are many changes in custody"

Internal consistency. The reader examines if the ideas expressed in the text are logically consistent with one another. For example, while explaining the meaning of the sentence "Sometimes custody arrangement can work out in a friendly way," Student L said,

(Text) "Usually, custody arrangements can be worked out..."

(Romanized Chinese) "tung1chang2 ... she2mo5 ... arrange ... wang4ji4le5 ... she2mo5 ke2yi3 ... ke2yi3 gong1zuo4? bu4ke3neng2 ba5 ..."

(Back Translation) "Usually ...what ...arrange ...I forgot ...What can ...can work? No ...It's impossible ..."

Student L defined the meaning of the phrase "work out" as "gong1zuo4" (job) because he saw the word "work." However, Student L rebutted what he had said immediately.

External consistency. The reader checks that the facts presented in the text are true and consistent with what she already knows. For example, after Student J read through the interpretation of the first sentence in her own first-time think-aloud transcript, she said the following:

(Text) "...divorces...."

(Romanized Chinese) "en...jiou4shi4 she2mo5 li2huen1 ma1?"

(Back Translation) "Well...is that divorce?"

Then the teacher asked her why she defined "divorce" as "li2huen1" (divorce), she replied in the following way.

(Romanized Chinese) "wo3 kan4 wen2zhang1, ran1ho4 you3 ting1 guo4 zhe4ge5 zi4"

(Back Translation) "I read the context, and I've heard of that word before."

Propositional cohesiveness. The reader checks that there is a cohesive relationship among propositions sharing a local context. For example, when interpreting the sentence "...but sometimes there are bitter battles over custody.....," Student L said,

(Text) "...battle..."

(Romanized Chinese) "battle ...shi4 'battle' ma1? 'battle' shi4 ping2zi5 ma1? bu2shi4 ba5..."

(Back Translation) "battle...is it battle? Does battle mean bottle? No..."

Informational completeness. The reader reviews whether the text provides all of the information necessary for full understanding. In Student B's case, he said,

(Romanized Chinese) "shang4ci4 mei2you3 jiang3dao4 zhe4li3"

(Back Translation) "I didn't mention it last time."

He then reinterpreted the meaning to make up his comprehension of the text.

Structural cohesiveness. The reader examines the thematic compatibility of the ideas in a paragraph or text. One example came from Student J. When "thinking aloud" the second paragraph, Student J said,

(Text) "The judges in a court..."

(Romanized Chinese) "ran2ho4 zai4 fa3yuan4 zhong1 de5 fa3guan1...en...na4 wo3 ke3bu4ke3yi3 hui2qu4 cai1 na4ge5?...shi4 jian1hu4quan2 ba5."

(Back Translation) "Then judges in the court ...well ...Can I go back to guess the meaning of that word? Is it custody?"

It is noticeable that rather than merely engage in one level of the comprehension monitoring, the reader's cognitive process might be involved in more than one when decoding the meaning of a word or a sentence. For example, Student G said,

(Romanized Chinese) "fa3guan1 zai4 fa3yuan4 zai4 fa3yuan4 ..zai4 fa3ting2..' in a court'..ying1gai1 shi4 fa3ting2"

(Back Translation) judges in the court [fa3yuan4]...in the court [fa3ting2] I think it should be the "court" [fa3ting2]).

It is apparent that Student G struggled for decoding the meaning of the word "court" and tried to figure out the most appropriate meaning for it. In this situation, it could be said that Student G's cognitive process therefore remained at the lexical level. However, when struggling for decoding the word "court," Student G was also using her background knowledge to assist herself in comprehension. In this aspect, Student G has also involved the external standard in comprehension monitoring.

Results

According to Block (1992), the operation of comprehension monitoring can only be observable when failure of comprehension occurs. Thus, this section examines how the subjects in the present study operate their comprehension monitoring based on the think-aloud protocols. Table 2 shows one of the proficient readers in operating her comprehension monitoring and Table 4 presents one of the less-proficient readers in conducting her comprehension monitoring.

Table 2: *A Proficient Reader's Operation of Comprehension Monitoring*

Student J
<p>(Text)</p> <p>Paragraph 1</p> <ol style="list-style-type: none"> (1) One of the most difficult problems in many divorces is determining custody of the children. (2) Parents should know their legal rights and responsibilities when deciding who will take care of the children. (3) However, this is not easy, since there have been many changes in custody arrangements through the years. (4) A hundred years ago in the United States, the father always received custody. (5) Later, custody was most often given to the mother because the mother was considered the more important caregiver. (6) At the present time, while custody is still usually awarded to the mother, more and more fathers are asking for and receiving custody. <p>Paragraph 2</p> <ol style="list-style-type: none"> (7) The judges in a court...
<p>(Romanized Chinese)</p> <p>Paragraph 1</p> <ol style="list-style-type: none"> (1) en...xiu3duo1 de5 wen4ti2...en...zhi1yi1...en...bu4zhu1dao4 (laughing)...she2mo5 she2mo5 guan1yu2 xiao3hai2 de5 ba5. (2) fu4mu3 ying1gai1 zhi1dao4 ta1men5 de5 quan2li4 han4 ze2ren4 dang1 jue2ding4 shei2 yao4 zhao4gu4 na4ge5 xiao3hai2... (3) en...wu2luen4ru2he2 zhe4 bu4rong2yi4. en...zi4cung2 ta1men5 en...zi4cung2... she2mo5 you3 hen3duo1 ji1hui4... ran2hou4... bu4zhi1dao4... zhe4xie1nian2... (4) yi4bai3nian2qian2, mei3guo2 fu4qin1 yung3yuan3... (5) en...ran2hou4 guo4le5 vi2zhen4zi5. na4ge5 zhe4zhong3 dong1xi1 vou4 tong1chang2 shi4

jiao1ge3 mu3qin1, yin1wei4 ma1ma1 bei4 ren4wei2 bi3jiao4 zhong4yao4 de5...

- (6) zai4 xian4zai4...en...zhe4ge5...reng2ran2 shi4...wo3 xiang3 ying1gai1shi4...suan4le5! (T: ni3 ren4wei2 shi4 she2mo5?) ying1gai1 shi4 xing4shi4 ba5. (T: xing4shi4? ni3 zai4 ji4xu4 kan4xia4qu4) shi4 ge3 ma1ma1 de5. ran2hou4, you3 yue4lai2yue4duo1 de5 ba4ba4 hui4 yao1qiou2 jie1shou4 zhe4ge5.

Paragraph 2

- (7) ran2hou4 zai4 fa3yuan4zhong1 fa3guan1...en...na4 wo3 ke3bu4ke3yi3 hui2qu4 cai1 na4ge5? (T: ke3yi3) shi4 jian1hu4quan2 ba5.

(Back Translation)

Paragraph 1

- (1) Well...many difficult problems...hm...one of the...hm...I don't understand (laughing)...bla bla I think it's about children.
- (2) Parents should know their legal rights and responsibilities when deciding who is going to take care of the children...hm...
- (3) However, it is not easy. Hm...since they...hm...since...bla..there are many chances...then...I don't understand this...these years...
- (4) One hundred year ago, American fathers always...hm...
- (5) then later...that stuff usually was given to mothers because mothers were regarded as more important...
- (6) now...hm...this...still...I think it should be...well...nothing! (T: What do you think it means?) I think it is "full-name." (T: full-name? Well, keep on reading) It was given to the mother. Then, more and more fathers asked for receiving it.

Paragraph 2

- (7) Then, judges in the court...hm...can I go back to guess the meaning of that word? (T: Yes) I think it means "custody."

Interpretation of the Protocol

Sentence #1: Student J failed to comprehend the meaning of "divorces" and "determining custody."

Sentence #2: Student J accessed the meaning of the whole sentence successfully.

Sentence #3: Student J was not only unable to interpret the meaning of "custody arrangements" and "through" but also misunderstood the meaning of "changes."

Sentence #4: Again, while Student J encountered the word "custody," she failed to access its meaning. As a result, she was unable to interpret the meaning of "received custody."

Sentence #5: Since Student J was still unable to explain the meaning of "custody", she chose to suspend it and used the word "stuff" to replace "custody" to make the meaning of the sentence more complete. On the other hand, Student J encountered another difficult word "caregiver" and failed to comprehend it as well.

Sentence #6: Before fully finishing the interpretation of this sentence, Student J guessed the meaning of "custody." Originally, she intended to give up. After being encouraged by the teacher, Student J gave the meaning of "full-name" to "custody." For the following sentence, Student J comprehended its meaning without difficulties.

Sentence #7: Student J correctly explained the meaning of "Judges in a court." Then she asked the teacher if she could go back to guess the meaning of "custody" again. Finally, Student J successfully accessed the meaning of "custody."

How Student J Comprehended the Meaning of "Custody"

From the protocol analysis described previously, it is clear that while some sentences were entirely comprehended by Student J, others remained either partially comprehended or not comprehended at all. The integrated meanings of all propositions gained by Student J, then, could be combined together to give Student J's comprehension of the first paragraph and the very beginning sentence of the second paragraph.

Propositions Comprehended by Student J:

- (1) One of the most difficult problems + children +
- (2) Parents should know their legal rights and responsibilities when deciding who will take care of the children +
- (3) However, this is not easy, since + the years +
- (4) A hundred years ago in the United States, the father always +
- (5) Later + was most often given to the mother because the mother was considered the more important +
- (6) At the present time + is still usually awarded to the mother, more and more fathers are asking for and receiving +
- (7) The judges in a court

Which Comprehension Monitoring Standard Has Been Involved in Student J's Reading Process

Based on the previously stated propositions comprehended by Student J, Student J's engagement in the cognitive standard of comprehension monitoring could be analyzed as in Table 3.

Table 3: *Analysis of Student J's Engagement in Comprehension Monitoring*

Propositions	Cognitive Standard
(1) One of the most difficult problems + children	lexical standard
(2) Parents should know their legal rights and responsibilities when deciding who will take care of the children	lexical + syntactic standards
(3) However, this is not easy, since + the years	lexical standard
(4) A hundred years ago in the United States, the father always	lexical + syntactic standards
(5) Later + was most often given to the mother because the mother was considered the more important	lexical + syntactic standards
(6) At the present time + is still usually awarded to the mother, more and more fathers are asking for and receiving	lexical + syntactic standards
(7) The judges in a court	lexical standard

When examining the propositions that were comprehended successfully by Student J, it is apparent that Student J's comprehension has been primarily monitored by the lexical and syntactic standards in cognition. Although it seems that Student J merely engaged in the lower comprehension monitoring standards, it is noticeable that sufficient, basic language knowledge has enabled Student J to monitor the whole on-going thinking process at higher levels, such as internal consistency and external consistency. This might be best supported by the evidence that when Student J read Sentence #7, very quickly, she integrated the new information of "the judges in a court" with the existing comprehended propositions, which led to Student J's triumphant access to the meaning of "custody."

Table 4: *A Less-Proficient Reader's Operation of Comprehension Monitoring*

Student F
<p>(Text)</p> <p>Paragraph 1</p> <ol style="list-style-type: none"> (1) One of the most difficult problems in many divorces is determining custody of the children. (2) Parents should know their legal rights and responsibilities when deciding who will take care of the children. (3) However, this is not easy, since there have been many changes in custody arrangements through the years. (4) A hundred years ago in the United States, the father always received custody. (5) Later, custody was most often given to the mother because the mother was considered the more important caregiver. (6) At the present time, while custody is still usually awarded to the mother, more and more fathers are asking for and receiving custody. <p>Paragraph 2</p> <ol style="list-style-type: none"> (7) The judges in a court look at each parent's personality and caregiving ability in order to determine who can best take care of the children.
<p>(Romanized Chinese)</p> <p>Paragraph 1</p> <ol style="list-style-type: none"> (1) yo3yi2ge5 hen3kuen4nan2 de5 wen4ti2, zai4...hui4...fa1sheng1 zai4...shiao3hai2zi5 shen1shang4. (2) ran2ho4, fu4mu3 hui4 zhi1dao4 ta1men5...en...dui4de5 hen4...en...she2hui4 guan1shin1 ta1men5 de5 shiao3hai2zi5. (3) ran2ho4, bu4guan3zen3yang4 ta1 bu2shi4 hen3 jian3dan1 de5...cong2...hen3duo1 de5...gai3bian4...zai4 she2mo5nian2 zhi1ho4. (4) yi4bai3nian2ho4...zai4...zai4 mei3guo2...ran3ho4...she2mo5 ba4ba4 hui4...chang2chang2... (5) ...en...ran2ho4...hui4 ge3 ma1ma1...yin1wei4 mu3qin1 hui4...hen3 zhong4yiao4...de5.. (6) ran2ho4...zai4 ren2lei4 de5 shi2jian1...chang2chang2...en...tong1chang2 zai4 ma1ma1 de5 shen1shang4 ...ran2ho4...ran2ho4 ba4ba4 hui4 shuo1... <p>Paragraph 2</p> <ol style="list-style-type: none"> (7) ...ran2ho4...en...hui4 kan4...mei3ge5 ren2...mei3ge5 fu4mu3qin1...ran3ho4...she2 ke2yi3 hen3hao3de5 zhao4gu4 shiao3hai2zi5.

(Back Translation)

Paragraph 1

- (1) There is a very difficult problem in...it can happen to children.
- (2) Then, parents can know they...mm...are right and...mm...who will take care of their children.
- (3) Then, however it is not very easy...from...many...changes...after... what years.
- (4) After a hundred year...in...in America...then...what's that?...fathers would ...often...mm...often...
- (5) mm...then...given to mothers...because mothers will...very important...
- (6) Then...in human's time...often...mm...often given to mothers...then...then fathers would say...

Paragraph 2

- (7) ...then...mm...would look at...everyone...each parent...then...who can best take care of children.

Interpretation of the Protocol

Sentence #1: Student F was unable to comprehend "divorces" and "determining custody."

Sentence #2: Student F failed to decode that "right" is used as a noun rather than an adjective. Besides, she did not comprehend "responsibility" and seemed to have difficulty in understanding the sentence structure of "when deciding."

Sentence #3: Student F misunderstood the meaning of "since" and failed to comprehend the sentence structure of "there have been." In addition, she was unable to understand the meaning of "custody arrangements" and misinterpreted the meaning of "through the years."

Sentence #4: Student F failed to interpret the meaning of "a hundred years ago" as she explained it as "after a hundred years." Again, Student F was unable to comprehend the meaning of "custody" and did not comprehend "received" as well.

Sentence #5: Except "custody," in this sentence Student F was unable to interpret the meaning of "considered" and "caregiver." Besides, unlike Student J who replaced the word "custody" with "stuff" in order to make the meaning of the sentence more complete, Student F did not use any word to substitute "custody," which left the meaning of the sentence incomplete.

Sentence #6: Student F misunderstood the meaning of "at the present time" and decoded it as "in human's time." Still Student F was unable to comprehend the meaning of "custody" and "receiving" and misinterpreted the meaning of "asking for" as "say."

Sentence #7: Student F failed to comprehend the meaning of "judges," "personality," "caregiving

ability," and "determine." In addition, she was unable to understand the sentence structure of "in order to" as well.

How Student F Comprehended the Meaning of "Custody"

From the protocol analysis described previously, it is found that most of the time Student F either misinterpreted or failed to comprehend the meanings of words due to her limited vocabulary knowledge. In addition, sentence structures or grammar seemed to be problems for her. All the meanings of propositions gained by Student F are combined together to demonstrate her comprehension of the first paragraph and the very beginning sentence of the second paragraph.

Propositions Comprehended by Student F:

- (1) one of the most difficult problems + children +
- (2) parents + know + who will take care of the children +
- (3) however + this is not easy + many changes + years +
- (4) a hundred year + in the United States + the father always +
- (5) given to the mother + because the mother + important +
- (6) to the mother + fathers +
- (7) look at each parent's + who can best take care of the children.

Which Comprehension Monitoring Standard Has Been Involved in Student F's Reading Process

Based on the previously stated propositions comprehended by Student F, Student F's engagement in the cognitive standard of comprehension monitoring could be analyzed as in Table 5.

Table 5: *Analysis of Student F's Engagement in Comprehension Monitoring*

Propositions	Cognitive Standard
(1) one of the most difficult problems + children	lexical standard
(2) parents + know + who will take care of the children	lexical standard
(3) however + this is not easy + many changes + years	lexical standard
(4) a hundred year + in the United States + the father always	lexical standard
(5) given to the mother + because the mother + important	lexical standard
(6) to the mother + fathers	lexical standard

(7) look at each parent's + who can best take care of the children	lexical standard
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It is apparent that Student F's comprehension remained at the lexical level, for she had difficulties understanding the whole sentence structure and thus left the meaning of the sentence incomplete. Besides, comprehension at the lexical level, which was monitored by the lexical standard, did not give Student F's sufficient data for monitoring the whole on-going thinking process at the higher cognitive standards. As a result, unlike Student J, Student F failed to comprehend the first half of the text and left the information scattered.

Development of Comprehension Monitoring Through Teacher Intervention

In the second-time diagnostic and remedial task, both the proficient and less-proficient readers' development in comprehension monitoring was apparent through teacher intervention. The development of comprehension monitoring of the two groups of subjects in the two-phase tasks is presented in Table 6.

Table 6: *Differences in Development of Comprehension Monitoring Between the Proficient Readers and Less-Proficient Readers*

Less-Proficient Readers

Subject and Task Number	A		B		C		D		E		F	
	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd
Lexical Standard		X		X	X	X		X		X		X
Syntactic Standard		X										X
Internal Consistency	X	X	X	X								X
External Consistency	X		X		X							X
Propositional Cohesiveness		X	X	X		X						
Informational Completeness				X								
Structural Cohesiveness	X			X								

Proficient Readers

Subject and Task Number	G		H		I		J		K		L	
	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd	1 st	2 nd
Lexical Standard	X	X		X		X		X		X	X	X
Syntactic Standard		X				X				X	X	X
Internal Consistency	X		X		X		X	X		X	X	X
External Consistency	X				X		X	X			X	X
Propositional Cohesiveness	X			X	X						X	X

Informational Completeness												
Structural Cohesiveness								X		X	X	X

Table 6 presents the standard at which each subject's comprehension monitoring was working and how each subject's comprehension monitoring developed. For example, Subject A only got involved in the standards of internal consistency, external consistency, and structural cohesiveness in the first-time think-aloud task. In the second task with teacher intervention, he was able to utilize the lexical and syntactic standards and that of propositional cohesiveness. Likewise, proficient readers' involvement in comprehension monitoring levels became more diversified through teacher intervention.

Conclusion

From the results of this study, it is apparent that comprehension monitoring functions to check whether the propositions in a text are comprehended correctly. Similar to different levels of reading comprehension, comprehension monitoring also includes several standards (levels): the lexical and syntactic standards, internal consistency, external consistency, propositional cohesiveness, informational completeness, and structural cohesiveness. While the lexical and syntactic standards are used to examine the correspondent levels -- both lexical and syntactic -- in comprehension, the other standards in comprehension monitoring are responsible for integrating new information with existing knowledge. One fact that cannot be ignored is that even the less-proficient reader has some competence in comprehension monitoring since they are able to access the appropriate meaning of certain words or sentences.

But what are the differences in comprehension monitoring between proficient and less-proficient readers' reading processes? When the meaning of a word, phrase, or sentence is "correctly" understood by readers, then comprehension monitoring has accomplished its task. Texts are constructed, at least unconsciously, with this in mind. The occurrence of the lexical and syntactic standards of comprehension merely depends on the lexical and syntactic comprehension of the text. The emergence of higher standards of comprehension monitoring follows the comprehension of a large portion of the text at the lexical and syntactic levels. A reader must have sufficient resources, i. e. language knowledge, for his/her comprehension monitoring to operate at a higher standard which leads to the higher levels of comprehension of the text. This distinguishes the proficient reader from the less-proficient one in terms of the occurrence of comprehension monitoring at higher levels.

The most significant difference between the two groups in the comprehension monitoring process, was that the proficient readers seemed to monitor their on-going reading process retrospectively, while the less-proficient readers seemed to be mostly limited to the lexical level of the word. While reviewing the 6 proficient readers' think-aloud protocols, it was found that 5 of them were able to decode the meaning of "custody" as they progressed to the rest of the passage, even though they had failed to even approach its meaning at the earlier stage. The abrupt comprehension of a word that was not decoded previously demonstrated the proficient readers' competency to monitor their comprehension process retrospectively. This verification is

based on the assumption that the proficient readers had to be able to integrate all the information they had received and associate it with prior knowledge both internal and external to the text. Otherwise, the possessed information would be merely left as sporadic, the phenomenon that less-proficient readers encounter.

As mentioned previously, since comprehension monitoring is not something that one can acquire through practices or drills, teacher intervention might, therefore, serve as a possible solution for enhancing students' comprehension monitoring competency. It is found in this study that teacher intervention did enhance the less-proficient readers' development of comprehension monitoring, through providing them with basic knowledge about language use as the necessary resource for comprehension monitoring and the integration of sporadic information.

The function of teacher intervention was to compensate for the less-proficient readers' shortage of resources for solving their reading problems. In other words, the reading teacher could help the less-proficient readers better access the cueing system of the text while reading. Comprehension monitoring occurs because there is something available to be monitored. We know what has been done incorrectly because we are able to "stand back" and examine whether something incorrect has been done.

In terms of integrating information, the reading teacher helped the less-proficient readers absorb information in an organized way to better approach the gist of the text. The reading teacher also assisted the less-proficient readers in suppressing the irrelevant information that was activated in their minds. Either by integrating the information or suppressing the irrelevant information, the processes that the reading teacher went through provided the less-proficient readers with a good model of how to monitor their on-going thinking process retrospectively, dynamically, effectively, and systematically.

Teacher intervention also raised readers' awareness in detecting reading miscues. That is, teacher intervention reminded students to examine the consistency of their interpretation and to notice the differences between the first and second think-aloud procedures and change their inappropriate interpretations of words. As stated by Dubin, Eskey, and Grabe (1986), "the role of the teacher is to facilitate reading, raise consciousness, build confidence, ensure continuity and systematicity, show involvement and demand performance" (p. 44).

What does all of this imply in the field of EFL reading instruction? First, equipping students with the competency of comprehension monitoring is no less significant than specific reading strategies. Comprehension monitoring is crucial because readers need to possess the ability to be aware of what kind of reading problems they are encountering, and what kind of strategies could be used to solve them. In addition, the ability of comprehension monitoring enables readers to integrate new information with either old or background knowledge as well as to detect whether the interpretation of texts follows both internal and external consistency (Baker, 1996).

Secondly, instruction in basic language knowledge should go before that of comprehension monitoring, for comprehension monitoring can only become possible when there is something available to be monitored. For many years, researchers only focused on seeking either "efficient reading strategies" to help readers solve problems, or the so-called "metacognitive strategies" to

build up readers' comprehension monitoring. However, the truth is that if readers do not possess sufficient basic language skills, then no matter how many diversified reading strategies they are equipped with, and how much training in metacognitive strategy usage they receive, the process will turn out to be fruitless if they have no basic resources to access when attempting to solve problems. They must have extensive resources to monitor whether their understanding of the text is coherent and logical.

Thirdly, reading teachers need to engage in their less-proficient readers' on-going thinking process as they read, so that both the internal and external consistency of the text can be maintained. This corresponds to Vygotsky's (1978) claim that learners develop the capacity for self-regulation through interaction with more knowledgeable others. By interacting with knowledgeable others, self-regulation skills are fostered and further enable the learner to monitor his/her own progress, to set reading goals, to allocate attention, to plan reading activities, and so on. That is, comprehension monitoring can be developed through interaction with reading teachers.

The interaction provided by the reading teacher guides the flow of the less-proficient readers' thinking process to access the meaning of the text to a greater extent. Students' feedback then served as an indicator that empowered the reading teacher to identify the difficulties that students might encounter while reading and thus enabled the reading teacher to provide possible or appropriate solutions to solve reading problems.

The enhancement of the less-proficient readers' development of comprehension monitoring through the previously described flow is very likely to have been due to the fact that teacher intervention in the students' thinking processes was actually the stimulus and an on-purpose action that equipped the less-proficient readers with new strategies to overcome their reading difficulties. Another possibility is that teacher intervention successfully activates the less-proficient readers' existing linguistic knowledge, background knowledge of the text, or reading strategies, that existed internally but were being inappropriately inhibited or utilized.

The most critical issue in the development of comprehension monitoring is how it can function most efficiently and automatically. So far, proficient readers' consistent, dynamic, and continuous comprehension monitoring process, and the influence of teacher intervention on enhancing the development of comprehension monitoring, seem to promise a bright future.

The problem of figuring out the right resources to use in fostering the acquisition of automatic and effective comprehension monitoring may be solved by an awareness of less-proficient readers' incapability in the categorization of information. Unskilled readers tend to have sporadic information in their minds. That is, they seem to store what they have learned in an unsystematic and unorganized way. As a result, when activation of relevant information is required, they might well have to spend a lot of time searching for the information, which leads to inefficiency and non-automaticity of comprehension monitoring.

This implies in the field of EFL teaching that less-proficient readers might need to acquire English reading through systematic categorization. That is, reading teachers should select articles that share related information to instruct less-proficient readers. In this way, less-proficient

readers learn vocabulary with the categorization explicit and so internalize what they have learned according to categories instead of sporadically. Since less-proficient readers are likely to benefit less from organizing knowledge independently, then the categorization of items through teachers' purposely planned instruction might facilitate less-proficient readers' learning.

Endnote

1. The present study adopted the mean scores as the referential indicator for grouping the subjects into proficient and less-proficient ones. Therefore, even though Student F obtained eighty-five score points in the final exam, he was classified as a less-proficient reader because his mean score is about sixty-two. Similarly, although Student D and H got the same scores in the mid-term exam, Student D was grouped as a less-proficient reader because he only obtained forty-four in the final and his mean score point is only fifty-eight.
2. Numerals embedded in the Romanized Chinese text correspond to levels and types of lexical tone.

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Appendix A

The English Text for Training in the Think-Aloud Task

During the summer session there will be a revised schedule of services for the university community. Specific changes for intercampus bus services, cafeteria, summer hours for the infirmary and recreational and athletic facilities will be posted on the bulletin board outside of the cafeteria. Weekly movie and concert schedules which are in the process of being arranged will be posted each Wednesday outside of the cafeteria.

Intercampus buses will leave the main hall every hour on the half hour and make all of the regular stops on their route around the campus. The cafeteria will serve breakfast, lunch and early dinner from 7 a.m. to 7 p.m. during the week and from noon to 7 p.m. on weekends. The library will maintain regular hours during the week, but shorter hours on Saturdays and Sundays. Weekend hours are from noon to 7 p.m.

All students who want to use the library borrowing services and the recreational, athletic, and entertainment facilities must have a valid summer identification card. This announcement will also appear in the next issue of the student newspaper.

- 1) Which of the following is the main purpose of this announcement?
 - (A) To tell campus personnel of the new library services.
 - (B) To announce the new movies on campus this summer.
 - (C) To notify university people of important schedule changes.
 - (D) To remind students to validate their identification cards.

- 2) Which of the following facilities are listed in this announcement, for specific schedule revisions?

- (A) Athletic and recreational.
 - (B) Food and transportation.
 - (C) Bookstore and post office.
 - (D) Medical and audio-visual.
- 3) Times for movies and concerts are not listed in this announcement because
- (A) a film or concert occurs every Wednesday at 7 p.m.
 - (B) the full list would be too long.
 - (C) films and concerts cannot be announced publicly.
 - (D) the full list is not ready yet.
- 4) According to the announcement, a validated identification card is required to
- (A) ride on intercampus buses.
 - (B) read announcements in the cafeteria.
 - (C) make use of the infirmary.
 - (D) check books out of the library.
- 5) The main purpose of this announcement is to help members of the university community to
- (A) make better use of intercampus buses.
 - (B) secure faster service in the cafeteria.
 - (C) make more effective use of campus facilities.
 - (D) obtain extension on overdue library books.

Appendix B

The English Text for Testing in the Think-Aloud Task

One of the most difficult problems in many divorces is determining custody of the children. Parents should know their legal rights and responsibilities when deciding who will take care of the children. However, this is not easy, since there have been many changes in custody arrangements through the years. A hundred years ago in the United States, the father always received custody. Later, custody was most often given to the mother because the mother was considered the more important caregiver. At the present time, while custody is still usually awarded to the mother, more and more fathers are asking for and receiving custody.

The judges in a court look at each parent's personality and caregiving ability in order to determine who can best take care of the children. Usually, custody arrangements can be worked out in a friendly way, but sometimes there are bitter battles over custody and even the kidnapping of a child by the parent who wasn't awarded custody. Too often these battles do great harm to the children the court is trying to protect, so courts and family counseling services have begun to use mediation to help families make the best decision for the children.

- 1) The main purpose of the first paragraph is to
 - (A) explain parents' legal rights about child custody.
 - (B) describe how custody arrangements have changed through the years.
 - (C) explain how difficult it is to determine custody of the children.
 - (D) state the principles of child custody.

- 2) What does the article say about child custody at the present time?
 - (A) The father usually receives custody.
 - (B) The mother is considered the more important caregiver.
 - (C) Custody time is shared by parents.
 - (D) It depends on the judge.

- 3) According to the article, which of the following statements is not true?
 - (A) More and more fathers think that they can take good care of the children.
 - (B) At the present time, the mother may be denied the custody right.
 - (C) A bitter fight in the court for the custody right is unavoidable.
 - (D) It is not easy for parents to know their legal rights and responsibility about child custody.

- 4) In the context of the passage, mediation means
 - (A) agreements.
 - (B) consultation.
 - (C) intervention.
 - (D) court decision.

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