Chapter 3

Methods

Participants

The participants of this study were 28 hilltribe students from the third grade of Chiang Mai Suksasongkraw School in ChiangMai province. This boarding-school serves a group of disadvantaged children who mostly come from poor families in the northern part of Thailand. The students in the school learn and use Thai language as the official language in school. They also learn to speak the local dialect in order to communicate to other students in the school.

The participants consisted of 28 students from 4 tribes (Karen, Hmong, Lisu, and, Lahu). The major number of students in the school come from the afore mentioned tribes.

The steps used in recruiting the participants are described below. The 95 hilltribe students of the third-grade level received 4 baseline stories (as described in the material section) to read orally. The students who met the following criteria were recruited in the study: (a) reading speed, 45 - 55 WPM, (b) comprehension scores, 25 - 50 percent of the comprehension test, (c) error detection scores, 10 - 50 percent of the misspelled words which were embedded in the stories, and (d) volunteering to participate in the experiment. The experimenter and an assistant recorded all students' reading times, error detection, and comprehension. There were 45 students who met the above criteria (see Appendix A -Table A1).

The experimenter balanced tribal membership as a way to reduce the influence of extraneous variables. The experimenter performed the participant selection in the following steps. First, determine the tribes which the major number of students in the school come from. The tribes consisted of Hmong, Karen, Lisu, and Lahu. Second, the students in these tribes were matched by sex, reading times, and comprehension scores. These resulted in 28 students in all tribes. Third, the students were distributed to 4 groups according to their matched scores. Finally, all groups were randomly assigned to 4 experimental groups: (a) repeated reading with self-directed behavior (RR+SDB), (b) repeated reading with teacher-directed behavior (RR+TDB), (c) non-repeated reading with self-directed behavior (NRR+SDB), and (d) non-repeated reading with teacher-directed behavior (NRR+TDB). (see Table 4). With the group combination, the treatment showed a 2 x 2 factorial design with reading method (repeated, non-repeated) as onw factor and directed behavior (self-directed, teacher-directed) as the second factor as shown in Figure 7

Figure 7

2 x 2 factorial Design

		Reading Method	
		RR	NRR
Directed Behavior	SDB	RR+SDB (n = 7)	NRR+TDB (n = 7)
	TDB	RR+TDB (n = 7)	NRR+TDB (n = 7)

Note. RR = Repeated reading, NRR = Non-repeated reading;

SDB = Self-directed behavior, TDB = Teacher-directed behavior.

Table 4

The Students in Each Group with Sex and Tribe

Group	RR+SDB		RR+TDB		NRR+SDB		NRR+TDB		Row
Tribe\Sex	Male	Female	Male	Female	Male	Female	Male	Female	Total
Hmong	1	1	1	1	1	1	1	1	8
Karen	2	-	2	-	2	-	2	-	8
Lisu	1	1	1	1	1	1	1	1	8
Lahu	-	1	-	1	-	1	-	1	4
Column Total	4	3	4	3	4	3	4	3	28

In Table 4, there were 4 males and 4 females in Hmong; 8 males in Karen; 4 males and 4 females in Lisu; and 4 females in Lahu.

Table 5

Means of Reading Skills in Each Group (n = 7)

Group	Reading Times (seconds)		Comprehension (5 scores)		Errors Detected (20 words)	
	M	SD	M	SD	M	SD
RR+SDB	397.75	22.35	2.11	0.38	7.07	2.05
RR+SDB	401.46	24.05	2.00	0.38	7.64	1.90
NRR+SDB	394.50	17.13	2.04	0.39	7.39	2.34
NRR+TDB	398.04	21.93	2.07	0.43	7.57	2.11

Note. For reading times, the smaller the reading time is, the faster the speed.

Table 5 showed means of reading skills in each experimental group. The comparisons among the four experimental groups showed no differences among means of reading times, errors detected and comprehension scores, $Fs_{(3,24)} = .122$, .103, .095, $ps < .946$, .957, .962, for reading times, errors detected, and comprehension, respectively (see Appendix D).

Material

The material used in this experiment included 27 stories at third-grade levels. The story selection involved several steps. First, 35 stories were selected from the well-known books at third-grade level. For examples, "Moo Yahng" (The roasted pig) and "Paw Kah Glaap" (chaff merchant) from Darun Saksa (Teera Tawsuwan, 1993), "Paw Kah Reh" (The hawkers) and "Mah Gaa Tee Nah Song Sahn" (The poor old horse) from Thai Language 3 (Ruji Pousara, Ekarin simahasarn, Wimolrat Niratikulchai, and Ratanatip Euhchaisit, 1993). Second, in order to control the story diversity, the stories were readjusted to meet the following criteria: (a) 350 words in length, (b) number of single and compound words were approximately equal, (c) sentence lengths were approximately equal, and (d) content withch attracted student's attention. Third, the experimenter had five expert teachers who have experience in teaching Thai in the primary level for at least 15 years to determine those stories. The experts determined the story mainly in three aspects, (a) appropriate to the third-grade level, (b) appropriate to the third-grade hilltribe children (e.g. the language structure was simple and easy to comprehend by hilltribe students), and (c) attractive to the hilltribe students. The stories selected in this study were acceptable to all experts.

Consequently, there were 30 stories in which all experts agreed, and 5 stories in which some experts disagreed. This study needed 27 stories for the material; thus,

three stories was randomly eliminated from the 30 the experts had unanimously chosen. Next, to assure that the stories were suitable for the participants (how easy they could be read), the experimenter asked a number of students at third-grade level in another hilltribe school to read the selected stories. Some questions were orally directed to the students to see whether they understand the texts, and how they felt about the stories. For example, do you like the story?, is it a short or long story?, do you understand the text?. The students' feedback provided the information for improving the stories to meet the story objectives.

Finally, of the 27 stories, the experimenter randomly selected 20 stories to be used as non-repeated stories. 5 of the non-repeated stories were randomly selected as the repeated stories. (see Table 6). The rest, 7 stories were randomly selected so that (a) 4 stories were used as baseline, and (b) 3 stories were used as generalization.

The repeated stories were implemented in the RR+SBD and RR+TDB groups. These stories included "Paw Kah Glaap" (A chaff merchant), "Keun Raak Tee Kow Pah" (The first night traveling)", "Nohk Nahng Aan" (The swallow), "Dehk Pi Kahn" (A handicapped boy), and "Dehk Dee" (A good girl). The non-repeated stories were implemented in the NRR+SDB and NRR+TDB group. These stories included "Yai Kawng Chahn" (My grand mom), "Lihng Nawy" (A little monkey), "Koh Nun Ta Wee Sahn" (A strong cow), "Paw Kag Reh" (The hawkers), "Lawng Eek Tee" (Try it again), "Sawng Pee Nawng" (two brothers), "Chy Yahk John" (A poor man), "Moo Yahng" (The roasted pig), "Loong Gahp Lahn" (The uncle and nephews), "Jiam Hin" (Jiamhin), "Mah Gaa Tee Nah Sohng Sahn" (The poor old horse), "Lahng Kah Boht" (The roof of a church), "Ah Mee" (The lovely Amy), "Kow Moung" (A city travelling) and "Kohn Sah Pow" (The careless man).

In the material design, the experimenter managed each of the repeated stories in 4 versions by embedding non-word and word errors in those versions (see the Story Device section for details). The sets of 4 versions called same-story set 1, to set 5. In contrast, the non-repeated stories were grouped to 5 sets of 4 different stories and called different-story set 1, to set 5 (see Table 6). It must be noted that a version of any different-story set meant a different story. However, each version of the different-story sets was managed with non-word and word errors in the same way as those in the same-story sets. It was important that all versions either in the same-story or different-story sets were administered in random to insure that there was no "multi-treatment interference" (Campbell & Stanley, 1963).

Table 6

Repeated and Non-repeated Stories

Version	Repeated Story (same-story)	Non-Repeated Story (different-story)
	Set 1	Set 1
V1	Paw Kah glaap	Yai Kawng Chahn
V2	Paw Kah glaap	Lihng Nawy
V3	Paw Kah glaap	Koh Nun Ta Wee Sahn
V4	Paw Kah glaap	Paw Kah glaap
	Set 2	Set 2
V1	Keun Raak Tee Kow Pah	Paw Kag Reh
V2	Keun Raak Tee Kow Pah	Lawng Eek Tee
V3	Keun Raak Tee Kow Pah	Sawng Pee Nawng
V4	Keun Raak Tee Kow Pah	Keun Raak Tee Kow Pah

Table 6 (ext.)

Version	Repeated Story (same-story)	Non-Repeated Story (different-story)
	Set 3	Set 3
V1	Nohk Nahng Aan	Chy Yahk John
V2	Nohk Nahng Aan	Moo Yahng
V3	Nohk Nahng Aan	Loong Gahp Lahn
V4	Nohk Nahng Aan	Nohk Nahng Aan
	Set 4	Set 4
V1	Dehk Pi Kahn	Jiam Hin
V2	Dehk Pi Kahn	Mah Gaa Tee Nah Sohng Sahn
V3	Dehk Pi Kahn	Ah Mee
V4	Dehk Pi Kahn	Dehk Pi Kahn
	Set 5	Set 5
V1	Dehk Dee	Lahng Kah Boht
V2	Dehk Dee	Kow Moung
V3	Dehk Dee	Kohn Sah Pow
V4	Dehk Dee	Dehk Dee

Note. V = version.

The stories used for baseline and generalization were similar to the non-repeated stories in that they met the same selection criterion as had been described. The list of baseline stories were "Nohk Kaak Tow" (A kaktow bird), "Mee Nawy Pee Kahn" (The little handicapped bear), "Moo Bahn My Bphn-Ry" (The untidy village), and "Koo Rahk" (The Lover). The generalized stories included

"Krah-Dty Gahp Krah-Rawk" (The rabbit and squirrel), "Jow Pah" (The leader dog), and "Dtow Tah Leh" (The green sea turtles).

Apparatus

A stopwatch (time in mini seconds) was the most important apparatus in recording reading times for the groups who performed repeated and non-repeated reading with self-directed behavior. The students in these groups were trained until they could use the stopwatch automatically while reading. The experimenter had evaluated the interobserver reliability of timing reading times by using a stopwatch before the treatment. Two teachers recorded 20 students reading a story (as defined in this study) at the same time by using stopwatches. The time differences between the two observers produced a very small differentiated mean, .0045. The high zero approach of the differentiated means indicating the high interobserver reliability (Hull, 1983 cited in Sompoch Iamsupasit, 1993). Thus, reading times as measured by stopwatches proved very high in reliability.

Story Device

Story device was the critical strategy to differentiate the stories in each set as described in the material section. The story device included misspelling and a comprehension test.

1. <u>Misspelling.</u> A device to examine the reading thoroughness of a material was done by having the students detect misspellings which were randomly embedded in that material. The misspellings in a version either of the same-story or different-story sets consisted of 20 errors (10 non-word and 10 word errors). The non-word errors, low-order level, indicated syntactic violations in word level. The non-word errors were pronounceable words but have no meaning (e.g. "กะเรพา" (sah reh pah) in

stead of "กะเพร้า" (sah pow = careless). The word errors indicated higher-order semantic violations in the sentence integration. The word errors were those similar to the right words but did not make sense in the sentences or contexts they were placed (e.g. "เขามาขาวของ" (kow mah kow kawng). "ขาว" (white) did not make sense in the sentence. The right sentence must be "เขามาขายของ" (Kow mah ky kawng = He has come to sell something). Thus, the misspellings used in this study were both low- and higher-order level of syntactic and semantic violations.

To create the misspellings in each version of the same-story sets or the different-story sets, the experimenter first identified the total number of two-or three-letter words as the target words. Some of these words were selected as the target words. A version required 20 errors (10 non-word and 10 word errors). Thus, there were 80 errors in 4 versions of a same-story set or a different-story set (20 errors per version). Second, the experimenter manipulated 20 errors in each version of the same-story or different-story set to 10 non-word errors and 10 word errors. The placement of the target words in all versions was very important. They had not be systemetically scattered through each version. In addition, the features of errors and their placements had to be varied across versions to prevent a pattern of misspelling.

The order of versions within the same-story sets or the different-story sets was randomly arranged. However, it must be noted that the fourth version of the same-story and the different-story sets were the same story (see Table 6). This was for the use of between-group comparison. Thus, the fourth version in each story set was also called common stories because they appeared in both type of the story sets.

Reliability for the misspelling was tested in the different-story sets. The 54 hill tribe students at grade-three level were tested on errors from each set. To test the reliability, the total scores of errors were computed in each version and then analyzed

by using the "Testqual Program" (testqual quality analysis) (Paitoon Pothisaan, 1991). The reliability coefficients for version 1 to 4 of the different-story were .92, .93, .93, and .93; and the reliability coefficients for the baseline and generalization stories were .90 and .87, respectively.

2. Comprehension Tests. Every version in both the same-story and different-story sets was assessed by five comprehension questions. A question had four choices. Therefore, there were 20 comprehension questions altogether in a story set. The criteria for selecting comprehension questions in this study were (a) questions of fact, (b) questions requiring a grasp of the main thought, (c) questions of inferences or conclusion, and (d) questions of word meanings. However, the four kinds of questions in the criteria were considered as literal or explecit comprehension (Spooncer, 1983) and they were appropriate to the poor third-grade hilltribe students. In fact, the students could answer those questions by reference to the passage they read.

The experimenter followed several steps to develop the test items for each version of the same- and different-story sets. First, a number of test items which fell in the above criteria was built for each version. The experimenter also considered the parallel form in creating the test items to assure that the items were equally applied in all versions. Second, the five expert teachers (the same experts who determined the stories)verified the items' construction. Third, 150 hilltribe students were asked to complete these tests. The experimenter did item analysis to determine the difficulty and discrimination power of the tests. The test items used in this study had high discrimination power, r = .40 and over, and moderate difficulty level, .40-.70. The experimenter adjusted the test items and created substitute test questions until they satisfied the 20 test items fore each set. To balance the comprehension questions

within a version, the test items were asked from the early, middle, and end sections of that version. For baseline and generalization stories, the test items were built the same way as described above. Therefore, there were 15 and 20 test items for the generalization and the baseline stories respectively according to the stories used in each kind of these tests.

Finally, the reliability was checked for each version in the different-story sets including the baseline and generalization stories. According to the "Testqual Program", the reliability coefficients, KR-20, for version 1 to 4 of the different-story sets, were .67, .77, .73, and .78, respectively; and for baseline and generalization stories were .76 and .63, respectively.

Self-Directed Techniques

Self-directed behavior was emphasized in this experiment. Four key techniques of self-directed behavior were utilized in the RR+SDB and NRR+SDB group. These techniques included (a) self-contract form, (b) self-recording (recording frequency), (c) self-evaluation (reading sheets), and (d) self-reinforcement (token economy, self-praise).

1. Self-Contract Form. The students who performed reading with self-directed behavior committed their reading change contracts for each session in the self-contract form with so-called reading behavior change contracts. The self-contract form mainly comprised goal setting and strategies to achieve the goals. In the reading change contract, the students specified the definite goals for each reading skill development. For example, a student preset the reading speed incrementaly increasing from the first to the fourth reading as 65, 70, 75, and 80 WPM, respectively; error detection was set at 9, 10, 12, and 14 words; and comprehension

was set at 2, 3, 4, and 5 points, respectively. Although the reading change contracts were made before starting each session, the students could adjust the preset goal prior to a later reading that might be closer to their reading ability. The self-contract form is illustrated in Appendix C.

2. Self-Recording. The students recorded their gained scores of reading times, error detection, and comprehension each time they read in the self-recording form (see Appendix C). In that manner, they could compare the actual outcome of the present reading to the previous reading scores. In practice, the students presented the recorded data on graphs. Each recorded reading was very important because it provided a baseline for the next reading.

3. Self-Evaluation, was a helpful technique for students to evaluate their reading performances. In other words, the students could judge whether they progressed in reading speed, error detection and comprehension after each reading. In fact, the students could clearly respond to these questions: are they satisfied with the errors detected at that reading compared to the previous reading? and are they better or worse in understanding when the present reading is compared with the previous one? For example, a student who has obtained 75 WPM at the second reading judged his or her reading as "very good" compared to 60 WPM at the first reading. In contrast, another student who obtained 63 WPM at the second reading would judge his or her reading as "fair" compared to the same 60 WPM at the first reading.

4. Reading sheet, a part of self-evaluation, consisted of a question "How well did you read?" and three levels of reading performance, very good, fair, and not so good which were symbolized by simple faces. (see Appendix C. Each level showed the students' satisfaction of their reading outcomes, for instance, "good" or "not so

good". The reading sheets helped the students to understand thoroughly their reading performances.

The level of judgments for each reading outcome was based on the comparison of the actual outcome with the previous reading. If the actual outcome was at least 10 percent better than the previous one, the rating would be "very good"; if it was more than the previous one, but did not gain 10 percent, the rating would be "fair"; if it was less than the previous one, the rating would be "not so good". For the ease of judgment, the experimenter provided the students with a hand book which made comparing between the actual reading and previous one simple to perform. Levels of judgment in either reading speed, error detection or comprehension were illustrated in a simple manner also..

5. Self-Reinforcement. This study employed the token economy system for the students to manage self-reinforcement. The students could provide themselves points for improvements in reading skills they had made. Credit cards were also given with the point system. The students could exchange a specified number of points for credit cards as specified by the experimenter before the treatment. They could use those cards for purchasing things they needed at the cooperative-store in the school.

The number of points which students gained were calculated from the percentage of improvements as described in the self-evaluation and reading sheet sections. The students could get 15, 10, and 0 points for the "very good", "fair" and "not so good" categories respectively. In addition, they could gain extra points if the reading improvement exceeded the "very good" level. For example, a students who read 65 WPM at the first reading, and 85 WPM at the second reading could get 13 extra points. The 65 WPM is the baseline for the second reading; thus, 85 WPM is

13 points more than 72 WPM, the 10 percent increase in speed improvement from the baseline. Consequently, the student got 15 plus 13 points that resulted in 28 points altogether for the second reading.

It was important to the student to gain the points, the student must achieve the preset goal or exceed that goal as described in the self-contract form. The subsequent preset goals were never set lower than the minimum goal that the student had already achieved. Although the reading change contracts were made before starting each session, the students could adjust the preset goal at the last reading that might be closed to his actual reading ability.

Again, administering the point system could be done by the students or the experimenter according to the group combinations. For example, the students in the RR+SDB and NRR+SDB groups ran the point system by their own, while those students in the RR+TDB and NRR+TDB group were run by the experimenter. The credit cards which the students got from the points could be exchanged with backup reinforcers such as candies, foods, drinks, study instruments, books, playthings or even personal effects.

In setting the exchange rate for the backup reinforcers, the experimenter first interviewed and observed the grade-three students for weeks to see what they bought from the cooperative store. The potential reinforcers were then listed; and the token cost (points) of each reinforcer was specified (some of the potential backup reinforcers and their costs have been shown in Appendix C). The full list of reinforcers and costs was posted in the study room to make the students aware of the criteria.

In addition to the token economy and point system, self-praise was another simple kind of self-reinforcement used in the study. Having had some improvement, the students praised themselves by saying, "Good I can do it". Similarly, the experimenter said "Good you can do it "for the students in teacher-directed groups.

Treatment Condition

The present study consisted of two treatment conditions in this study (a) repeated, and (b) non-repeated conditions. In fact, the conditions were defined according to the reading methods, repeated and non-repeated reading. As stated earlier, there were four experimental groups, repeated with and without self-directed behavior (RR+SDB, RR+TDB), and non-repeated with and without self-directed behavior (NRR+SDB, NRR+TDB). Therefore, the repeated condition included the RR+SDB and RR+TDB groups, and the non-repeated one included the NRR+SDB and NRR+TDB groups. The students in the repeated condition reread 4 versions of each of the same-story sets. In contrast, those students in the non-repeated condition read 4 versions of each of the different-story sets

In essence, the students in all groups performed the reading tasks as follows (a) read aloud 4 versions of the five story sets consecutively, (b) crossed out the misspelled words while reading, and (c) answered 5 written comprehension questions after reading each version. However, the techniques of self-diretected behavior were also implemented according to the group combination. The students in the RR+SDB and NRR+SDB group also employed the self-directed behavior in the course of their reading, while those students in the RR+TDB and NRR+TDB followed the teacher-directed behavior as has been mentioned.

Experimental Procedure

The experiment consisted of three phases: (a) initial phase, (b) treatment phase and, (c) final phase. The time duration was 2 weeks for the initial phase, and 11 weeks for the treatment and final phase.

Initial phase (Week 1 - 2)

The experimenter spent two days of the first week to build up rapport with students in each group. Meanwhile, the students were informed of the purpose of the study, benefits of participation, equipment to be used, and reading performances and tasks. The experimenter also introduced the assistant who would take part in the experiment.

After having had the necessary information, 2-3 students took turns in seeing the experimenter at the treatment room to have a specific training corresponding to their treatment conditions - repeated or non-repeated. For example, the students in the RR+SDB and RR+TDB group had a specific training in timing their own reading speed by using a stopwatch, crossing out misspelled words while reading, setting goals of reading, evaluating their own reading outcomes. The students in the NRR+SDB and NRR+TDB group were trained just in crossing out misspelled words and answering comprehension questions after finishing reading. They did nothing about the self-directed behavior.

The materials used in this phase were short passages. These passages were, in fact, similar to the stories used in the treatment, but they had a smaller amount of words. The passages contained 100-150 words and were more easily controlled. The main purpose of these passages was to familiarize the students with the procedures they had to undertake in the experiment.

The experimenter also introduced the instructions to be used in the treatment. The instructions delivered to all groups were:

"Read a text as fast as you can, and cross out the misspelled words you come across in the text as much as possible. After you finish reading, find the correct answers from the written questions about that text as much as possible".

In summary, the initial phase offered the participants key knowledge and pre-experience necessary to the treatment conditions.

Treatment Phase (Week 3 - 13)

There were five sessions in the treatment phase. A session corresponded with a set of stories in the same-story or different-story sets as presented in Table 6. In the experimental design, the students received the treatment individually. The individual students had to complete five sessions either of the same-story or different-story sets depending on his or her treatment condition.

The treatment sessions were conducted Monday through Thursday every week. The time periods were 9.00 to 11.00 A.M., and 14.00 to 16.00 P.M. Each session took approximately 40 - 60 minutes (10 - 15 minutes for a version). This allocated time included other activities (self-evaluation, the experimenter's feedback etc.). To ensure the treatment equivalance, the experimenter counterbalanced dates and time periods across the sessions with the participants. Therefore, the study could be minimized as to treatment interference.

It was important that, the experimenter cooperated with the teachers who were responsible for the participants' classes at the time they were in the treatment in order to remedy the missed subjects later.

The following sections described the students' tasks in each group in the treatment conditions

1. Repeated condition.

1.1 The RR+SDB group. The following steps were used for the students in the RR+SDB group:

1.1.1. The experimenter met a student individually in the treatment room and reviewed the reading tasks that the student needed to do together with self-directed behavior. The experimenter urged the student in utilizing self-directed behavior to improve his or her reading skills.

1.1.2 The student made a reading change contract for session 1 (see the self-contract form in Appendix C for details). The student's baselines for reading speed, error detection, and comprehension were very important in this step because they provided what skill levels this student needed to achieve in the first, second, third, and fourth reading. The experimenter determined the possibility of the contract before endorsing it as a witness.

1.1.3 After the student received a reading sheet, the first version of the same-story set (set 1), from the experimenter, this student went to his or her own seat and began to read that version aloud, recording the reading times, crossing out misspelled words while reading and recording the results on his or her reading sheet. Before the student started reading, the experimenter asked the student to record his or her reading sound by using a tape recorder given him. The researcher's assistant operated another tape recorder outside the treatment room without interfering with the students performance. The assistant additional recording was used to check out the correct time for his or her reading after the treatment.

1.1.4 When he or she was finished with the first version, the student returned it to the experimenter to check out the number of errors detected correctly, then the student asked for 5 written comprehension questions for that version which he or she had to complete. When he or she was finished, the student returned the answered sheet to the experimenter and received the correct number of errors detected by the experimenter. During waiting for the comprehension feedback from the experimenter, the student made graphs for error detection and reading speed to see how well he or she progressed at the end of the first reading. The student transformed the reading times into reading speed (WPM) by using the manual of speed transformation before plotting his or her graph. The student also received the right answers from the experimenter making it possible for him to make another graph showing his or her skill in comprhension.

1.1.5 The student further performed self-evaluation by choosing one of the three percentage figures showing his or her degree of satisfaction with reading speed, error detection, and comprehension (see Appendix C). At this time the student evaluated himself or herself according to the scores in skills improvement as has been mentioned in the self-enforcement section. Self-praise was also delivered by the student for the skills improvement.

1.1.6 Following the first version, the student read the second, third, and forth versions of the same-story set 1 once, and did the same things as described in 1.1.3-1.1.5. By the end of session 1, the student recorded all scores that he or she had obtained from each reading in his or her personal book. These scores could be changed into a number of credit cards as has been specified before in the treatment.

1.1.7 After the student had finished reading the five same-story sets, he or she read three more new stories which were designed for testing the skills

generalization. The student read each of the new stories only one time; the experimenter and the assistant recorded the student's reading times, errors detected, and comprehension scores independently, and did not show them to the student.

1.2 The RR+TDB group. The following steps were used for the RR+TDB group;

1.2.1 The experimenter met the student individually and reviewed the reading tasks the same as with the RR+SDB group. Before starting session 1, the experimenter made a plan for each version. The plan was similar to the reading change contract in the RR+SDB group. For example, the experimenter set the reading speed at 65, 70, 75, and 80 WPM for the first, second, third, and fourth reading. However, before doing so, the experimenter considered the student's baselines for all reading skills into account.

1.2.2 The student received the first version of the same-story set 1 to read aloud in front of the experimenter who was ready to record the student's reading speed immediately. While reading, the student crossed out the misspelled words as was done in the RR+SDB group. The experimenter recorded the student's reading time by using a stopwatch. Before start allowing the student to begin reading, the experimenter recorded the student's reading voice by using a tape recorder. The tape recorder was used later to check out the student's reading speed.

1.2.3 When the student finished the first version, the experimenter gave five written comprehension questions of that version for the student to complete. The experimenter's tasks in this step were to score the student's answers, compute the misspelled words, and make graphs for reading speed, error detection, and comprehension, to see the growth in these skills. The evaluation sheets, token

system, and other self-reinforcement that were regularly used in the RR+SDB group were also employed in this series by the experimenter.

1.2.4 The same processe occurred when the experimenter provided the student the second version of the same-story set 1 to read; and it was repeated until the student completed all four versions of the same-story set 1.

2. Non-repeated condition.

Each student in the NRR+SDB and NRR+TDB groups began session 1 by reading the first version of the different-story set 1 to the fourth version of this set in the same way as the RR+SDB and RR+TDB group.

In essence, the students in the NRR+SDB group followed the same procedures as were used by the students in the RR+SDB group except the different-story sets were employed. Similarly, the students in the NRR+TDB group followed the same procedure as the RR+TDB group except different-story sets were used for this group. In other words, in the RR+SDB and RR+TDB group students read the same stories; whereas, the NRR+SDB and NRR+TDB group read different ones.

Final Phase (Generalization condition)

The final phase began about a half an hour after the end of the last session (session 5) for each student. The final phase was defined as the generalization condition because three new stories were included in the test for evaluating a generalization of reading speed, error detection, and comprehension that might be emerged from the treatment conditions.

As the student finished reading his or her final story in his regular set, the experimenter allowed the student to leave the experimental room for a period of time (30 min.) When the student returned, the experimenter and the assistant handed out

three stories to the student to read consecutively. The student's reading times, errors detected and questions answered correctly were recorded during those readings and totalled after the third reading. Unlike the treatment condition, the student needed not to create any plan before reading in the generalization condition. He or she just crossed out the misspelled words while reading and answered five questions when finished reading in the same way as he or she did in the treatment conditions.

Measure

Although the students in each group performed reading in different ways according to the treatment conditions, they measured the same criteria. That was, each student recorded their results in the same criteria several times. It was done either at the beginning, between, or the end of each reading. The measures included (a) reading times, (b) errors detected, and (c) comprehension scores.

1. Reading Time, was a time allocated for reading a version of the same- or different-story sets and recorded in seconds and mini-seconds. Reading times were recorded by using a stopwatch. The students converted the reading time to reading speed (WPM) when representing it on a graph. For the ease of converting, the experimenter provided the manual of speed transformation for the students in the RR+SDB and NRR+SDB group.

There were three types of means of reading times used in the data analysis.

1.1 Mean reading times for the common story. These means were calculated from the fourth version of the five repeated stories. The mean reading times were used for testing the effects of repeated and directed behavior across groups (Hypothesis I, II).

1.2 Mean reading times for the repeated condition. These means were calculated from the same version of the five repeated stories. The mean reading times were used to compare between the RR+SDB and RR+TDB groups and to test the effects of repeated reading at each reading for the RR+SDB group (Hypothesis III and IV).

1.3 Mean reading times for generalization. These means were calculated from the new stories; and they were used to show the generalization of the reading skills by comparing to the first version of the same-story sets or the different-story sets (Hypothesis V).

2. Errors detected.

The errors detected scores were calculated from the number of errors (word and non-word errors) which the students detected correctly in the texts. There were also three types of mean errors detected (means for common stories, repeated condition, and generalization).

3. Comprehension Scores

The comprehension scores were computed from the corrected answers in which the students responded to 5 comprehension questions asked in reading each version. Thus in a session, the students had to complete 20 questions altogether for a same-story set or a different-story set, and 15 questions for the new stories. Scoring was as follows: 1 point for a correct answer, or 0 points for an incorrect one.

There were also three types of mean comprehension scores the same as the means developed for reading times and errors detected. Means for common stories, repeated condition, and generalization were also computed.

Analysis

This study administered several statistical procedures in the analysis. First, a 2 x 2 analysis of variance (ANOVA) was used for testing the differences between two factors. The two factors included repeated method (repeated, non-repeated) and directed behavior (self-directed, teacher-directed). The purpose of this analysis was to examine whether each reading skill was effected by the treatments. The differences were interpreted as indication that some of the variation might be attributable to that factor. Second, the 2 x 4 repeated-measure analysis of variance (mixed design) was used for comparing the means of groups consisting of repeated method and repetition. In this analysis, repeated method was a between-subjects factor, and repetition was a within factor. The main purpose of this analysis was to compare between the two repeated groups (RR+SDB, RR+TDB), and to examine whether each reading skill was effected by repetitions of the same texts. A simple main effect (Kirk, 1982) was also conducted to verify the interaction. Third, post hoc comparison were further taken to compare each pair of means in case of the RR+SDB group. Finally, generalizations of reading skills were examined graphically for repeated and non-repeated reading, and particularly in the RR+SDB group.