Lower-intermediate learners of English as a second language improve reading recall through use of text structure strategy

Ana Beatriz Areas da Luz Fontes
Renata Pigatto
Ingrid Finger
Universidade Federal do Rio Grande do Sul
Kristina Mangie
Chatham University

Abstract: *We investigated the efficacy of a shorter version of the Text Structure Strategy (TSS) training (MEYER, YOUNG & BARTLETT, 1989) with a group of native Portuguese speakers learning English as a second language, and a group of English monolingual speakers. In Experiment 1, English learners of low-intermediate proficiency received a 2-hour training session on the TSS in either Portuguese, or English. We expected a greater gain in reading recall measures for the group trained in Portuguese. Results from Experiment 1 showed only a slight increase in recall associated with the use of text structure for training in the first language, while accuracy of recalls improved significantly for the group trained in Portuguese. In Experiment 2, English native speakers received the same 2-hour training in English. We expected an increase in both reading recall measures after training. Contrary to what was expected, this group did not show any improvement with training. These findings are discussed in terms of how the two groups may be different.*
Keywords: *Reading strategy. Text structure. English as a second language.*

Título: *Aprendizes de inglês como segunda língua, nível baixo-intermediário, melhoram leitura com uso de estratégia de estrutura textual.*
Resumo: *Este estudo investigou a eficiência de uma versão mais curta do treinamento Text Structure Strategy (TSS) (MEYER, YOUNG & BARTLETT, 1989) com um grupo de aprendizes de inglês como segunda língua, e um grupo de falantes nativos de inglês. No Experimento 1, aprendizes de inglês de proficiência média-baixa receberam uma sessão de 2 horas de treinamento com o TSS em português ou em inglês. Era esperado que o grupo que recebeu treinamento em Português demonstrasse maior ganho nas medidas de recordação do texto. Resultados do Experimento 1 evidenciaram que os aprendizes de inglês treinados em português recordaram um pouco mais da estrutura do texto depois do treinamento. Quanto à qualidade do que foi recordado, no entanto, houve um aumento significativo para os aprendizes treinados em português. No Experimento 2, falantes nativos de inglês receberam o mesmo treinamento de 2 horas em inglês. Era esperado uma melhora para ambas medidas de recordação de texto para este grupo. No entanto, não houve nenhuma melhora com o treinamento. Os resultados dos*

dois experimentos são discutidos em relação a demais possíveis diferenças entre os grupos.
Palavras-chave: *Estratégia de leitura. Estratégia de estrutura de texto. Inglês como segunda língua.*

Introduction

Learning a second language requires effort, motivation, and practice. In countries where the second language is not spoken outside of the classroom, learning becomes more challenging due to the lack of opportunities to practice what is taught in school. In Brazil, for example, English as a foreign language is taught in secondary schools as part of the required curriculum. Brazilian students often take extracurricular English courses to aid in their learning of the language. However, these students usually achieve limited proficiency in English and one of the reasons for such lack of success is that English is very rarely used productively in contexts outside of the classroom. As a matter of fact, recent research evaluating the English proficiency of adults of 54 different countries has ranked Brazil at number 46, at the very low proficiency category (EDUCATION FIRST ENGLISH PROFICIENCY INDEX, 2012). A recent program of the Brazilian government called *Ciências sem Fronteiras* intends to award 101,000 scholarships to Brazilian college students to study abroad by the year 2015 (SCIENCE WITHOUT BORDERS, 2011). At the time the present study was conducted, in 2011 and early 2012, only about 20,000 scholarships had been awarded because, in most cases, students were not able to pass standardized English proficiency tests. In an attempt to at least partially address this problem, we designed an intervention to improve English reading skills of the students from a university in Brazil. More specifically, this intervention involved the training of a reading strategy, which targeted the development of recall and comprehension of text in English, an improvement considered crucial for these students' academic advancement and success.

The assumption underlying the intervention adopted in the study is that, as argued by Cohen (1998), language learning may be enhanced by increasing learners' awareness of the variety of

strategies they can use in the process of learning a second language. The author also emphasizes that the most effective approach to elevate learners' awareness is to provide explicit instruction on learning strategies.

In regards to the development of reading abilities in particular, especially in terms of recall and comprehension, Pressley and McCormick (1995) identified the most effective reading comprehension strategies as those in which the reader uses and analyzes the text structure to extract its main ideas. In doing so, they suggest, readers are able to separate main ideas from less important details of the text. Meyer, Brandt & Bluth (1980) argue that readers who use a structure strategy seek to identify and use the author's organization to develop their own understanding of the text.

Jeon and Yamashita (2014) acknowledge that a language problem surfaces when considering L2 reading comprehension abilities. Various degrees of difficulty occur throughout numerous L2 proficiency levels. However, when the focus of reading depends on the miniscule details (i.e. grammar), individuals lose sight as to what is important. Additionally, one's perception of the world may be culturally biased, forcing an individual to interpret new information according to schemas that have already been created. This concept makes reading comprehension difficult to ESL (L2) learners (CARRELL & EISTERHOLD, 1983). The more meaning that can be given to new information, results in a better chance of understanding. Over the years, there have been many suggestions to stabilize the balance between reading comprehension and content significance to an individual learner. Research has shown that child and adult readers are sensitive to structure (CARRELL, 1985). When structure is embedded within a text, reading comprehension and recall both improve. Also, Barnett (1988) suggests that structured text positivity correlates to one's reading comprehension and recall, especially considering various degrees of L2 proficiency.

Furthermore, findings from more recent studies (including SCHWARTZ, MENDOZA, & MEYER, 2013) suggest that when participants are trained to use language-learner strategies, most

stand a better chance of becoming more proficient in the target language. Researchers suggest that the conceptual knowledge of text strategies is transferable to different languages. For example, if an individual is taught a text structure strategy in his/her native language, the capabilities to use the same strategies while learning a new language will be maintained; however, one must be readily aware of resources (i.e. signal words for each strategy). Some researchers (BRISBOIS, 1995) suggest that this knowledge transfer can only occur after learners have attained a threshold of L2 knowledge (i.e., L2 beginner learners will have a more difficult time comprehending text, compared to L2 intermediate learners). In addition, evidence presented by Koda (1990, 1993, 2007) supports the transfer of L1 cognitive strategy to L2 reading even among readers from different L1 orthographic backgrounds.

Regarding how a reading strategy may benefit readers, Meyer and Ray (2011) argue that the use of a structure strategy helps readers organize ideas based on explicit or implied relationships communicated by the text, thus facilitating comprehension. A number of reading strategies that are based on text structure, such as the knowledge maps (k-maps) by Dansereau and colleagues (e.g., DANSEREAU et al., 1979; HOLLEY, DANSEREAU, MCDONALD, GARLAND, & COLLINS, 1979), the flowcharting of expository text by Geva (1983), the adoption of Graphic Organizers as a tool to develop discourse organization awareness (FLY, JEAN & HUNTER, 1988; MEDE, 2010), and the Text Structure Strategy (TSS) (MEYER, 1985; MEYER, BRANDT, & BLUTH, 1980; MEYER, YOUNG & BARTLETT, 1989; MEYER & POON, 2001, SCHWARTZ, MENDOZA & MEYER, 2013) have been shown to be effective in improving recall and comprehension of text.

The Text Structure Strategy (TSS), as designed in Meyer et al. (1989), is a training program that offers explicit instruction on how readers can use text structure and signal words to organize concepts during reading. Readers trained with the TSS learn that an author's goal is to convey a message by organizing

information in a comprehensible manner. The program emphasizes five basic structures: description, sequence, causation, problem-solution (question-answer) and comparison. Each of these structures has several signal words (e.g. words that cue to a certain type of structure) associated with them. During training with the TSS, readers are taught to recognize each structure and its associated signal words as a tool for identifying the main ideas of the text. Then, by using the same structure used by the author in their own written recalls, readers are able to better recall the text. The effectiveness of the structure strategy in improving reading recall and comprehension has been widely observed by Meyers and colleagues (e.g. COOK & MAYER, 1988; MEYER, 1985; MEYER & FREEDLE, 1984; MEYER & POON, 2001; MEYER, TALBOT, POON, & JOHNSON, 2001; MEYER, YOUNG & BARTLETT, 1989; MEYER, TALBOT, POON, & JOHNSON, 2001; MEYER, MIDDLEMISS, THEODOROU, BREZINSKI, MCDOUGALL, & BARTLETT, 2002; MEYER & WIJEKUMAR, 2007; MEYER, WIJEKUMAR & LIN, 2011, SCHWARTZ, MENDOZA & MEYER, 2013). In fact, the above mentioned positive effects on reading recall and comprehension have been observed through work with 4th graders to retired older adults, including elementary and middle school children, college students, and a few studies on second language learners and bilinguals.

In the first study that tested the effectiveness of structure strategy with learners of English as a second language, Carrel (1985) instructed high-intermediate English learners from a variety of linguistic backgrounds enrolled in an English learning program. While the experimental group received instruction on structure strategy, the control group read the same reading materials but worked in different activities. Carrel's (1985) results showed higher performance on measures of reading comprehension by the group that received structure strategy training compared to the control group. This effect was observed right after training, as well as three weeks later. Subsequent work with speakers of other languages confirmed the efficacy of instruction of strategies based on the structure of texts across

languages, including French (RAYMOND, 1993), Spanish (LEON & CARRETERO, 1995), and Dutch (BROER, AARNOUSTE, KIEVIET, & LEEUWE, 2002). In Raymond's (1993) study, native English speakers with high-intermediate proficiency in French were trained in the TSS in French. Pre- and post-test texts were also read in French; however recall was written in English. French-learners who received the TSS training recalled a greater number of ideas from text than the control group, which read the same materials but received no instruction. In more recent work with high-intermediate Spanish learners of English as a second language, Yeh, Schwartz, and Baule (2011) used eye-tracking techniques to investigate whether readers change their eye-movement patterns after training on the TSS. In addition to a significant increase in recall at post-test, they observed a change in readers' eye-movement patterns reflecting additional processing time of phrases and words signaling the text structure.

The present study

The evidence reviewed so far demonstrates that readers who learn to use a structure strategy through explicit training can show improvement of reading comprehension and recall. It is important to note that positive results were obtained with training ranging from 3 (YEH et al., 2011) to 7 (LEON & CARRETERO, 1995) sessions, totaling 5 (CARREL, 1985; and RAYMOND, 1993) to 9 (MEYER & POON, 2001) hours of instruction. However, in the context of the present study in which learners generally only meet briefly once a week (usually no more than three hours), such relatively lengthy training is not feasibly. Therefore, a question worth investigating is whether the effectiveness of the TSS would be observed with a shorter training time. The main objective of the present study, therefore, was to improve L2 learners' text comprehension and recall in the L2 using a shorter version of TSS. The shorter version of the TSS consisted of a one day, 2-hour training session. Additionally, we manipulated the language of instruction, such that one group received training in Portuguese, the participants'

native language, while the other received training in the target language, English. Based on the discussed body of evidence demonstrating the positive effects of TSS training, we hypothesized that the shorter version of the TSS training would improve readers' recall and comprehension of text in the L2. However, the amount of improvement was hypothesized to depend on language of instruction, such that greater improvement would be observed when instruction was delivered in Portuguese, the participants' native language. Britton, Glynn, Meyer and Penland (1982) showed that text characteristics, such as word frequency and syntax, make demands on readers' cognitive capacity and affect comprehension. They found that when the text contained a high number of low-frequency words and was syntactically complex, more cognitive resources were taken up which overwhelmed readers' ability to process and recall information. Accordingly, due to the groups' limited English proficiency, we expected training in English to be more cognitively demanding, and therefore restrict how much participants would benefit from training. This language-contingent differential cognitive load is then the focus on Experiment 2. The main research questions investigated in the present study are presented as follows:

> RQ1: Will a shorter version of the TSS training have a positive effect on reading recall and comprehension in the second language?
> RQ 2: Will the language of instruction used for training have an effect on the amount of improvement observed after TSS training?

These questions are addressed in the two experiments described next.

Experiment 1

In Experiment 1, we investigated whether a shorter version of the TSS training would improve L2 English learners' recall and comprehension of text in the L2. Additionally, we investigated

whether the language used for instruction would have an effect on how much participants would benefit from the training. Therefore, groups received training either in their native (Portuguese) or in their second language (English). It was hypothesized that the shorter version of TSS training would improve students' comprehension and recall of text in the L2. We also expected greater improvement when students were trained in their native language.

Methods

Participants

Participants were 115 native speakers of Portuguese enrolled as students in remedial English for speakers of other languages (ESOL) classes at the Universidade Federal do Rio Grande do Sul, Brazil. Failure to complete either the pre- or post-test phases led to an exclusion of 71 students. In addition, students whose self-ratings on the Language History Questionnaire (LHQ) (LI, SEPANSKI & ZHAO, 2006) reflected high proficiency in English (greater then 7.0, on a scale from 1-10) were also excluded from further analyses (n = 2). Only participants whose self-rated proficiency scores were considered in the low to intermediate category (below 7.0, on a scale from 1-10) were included in the sample. Thus, the final sample of 42 students consisted of 23 men and 19 women, with ages ranging from 14 to 55 years old (M = 26.3, SD = 8.4). Two separate sessions of remedial ESOL were taught every Saturday for students who needed to improve their English proficiency. The two courses were identical in content; they were divided into two sessions to manage the number of students per class. The sessions were randomly assigned to receive training either in English (n = 24), or in Portuguese (n = 18).

A one-way ANOVA comparing the groups on the following variables was conducted: age, frequency of English use, age at which participants started learning English, number of months participants had been studying English, self-ratings in English reading, writing, speaking and speech comprehension,

and average English proficiency (calculated by averaging across the four domains just mentioned). See Table 1 for a summary of participants' Language History Questionnaire data. Results only revealed differences in frequency of English use, [$F(1,40) = 14.89$, $MS = 47.09$, $p = .000$]. Follow-up t-tests indicated that the group receiving training in Portuguese used English less frequently [$M = 2.67$ (every few months), $SD = 1.45$] than the group receiving instruction in English [$M = 4.83$ (bi-weekly), $SD = 2.0$], $t(39) = 3.86$, $p < .001$. Overall, the groups were similarly matched on proficiency measures.

Table 1. *Second Language Learners' Language History Questionnaire Data.*

	English-training		Portuguese-training	
	M	*SD*	*M*	*SD*
Age	27.92	11.07	26.58	8.17
Frequency using English *	4.83	1.99	2.67	1.46
Age of acquisition of English	14.89	9.35	12.33	2.81
Time studying English	125.33	173.29	59.06	46.14
English reading proficiency	5.21	1.72	5.06	1.73
English writing proficiency	3.50	1.87	3.56	1.69
English speaking proficiency	3.21	1.50	3.44	1.92
English speech comprehension proficiency	4.33	2.06	4.44	1.82
Mean proficiency	4.06	1.48	4.13	1.57

* statistically significant $p < .05$

Materials

The materials used were adapted from Meyer et al. (1989) and similar to Yeh et al. (2011). These included advertisements that illustrated the five different types of structures (i.e. description, sequence, causation, comparison and problem-solution), as well as practice texts on comparison and problem-solution strategies. The problem-solution passages used for pre- [Fast Breeder Reactors (5 paragraphs; 17 sentences; 497 words)] and post-test [Solution for Supertankers (3 paragraphs; 15 sentences; 315

words)] were also borrowed from Meyer et al. (1989), and were matched in linguistic difficulty. The major difference between this and the original study was in the duration of training. In this study, participants received one 2-hour session of training on the TSS. Because the original format was constructed for multiple, longer training sessions, we modified the presentation (i.e. training) material to make it more concise while still keeping the main ideas of the structure strategy. We decided then to eliminate a lot of the activities and all the homework assignments from the original training. We also focused our training on the comparison and problem-solution structures by having the students work only on the practice text of these two structures during training. For testing though, we only used the two problem-solution texts previously mentioned.

In addition to the modifications described above, we also translated the English version of the concise training into Portuguese. The translation was made slide by slide by two Portuguese-English bilingual students who were advanced English majors at the university. The first author worked directly with the students in the translation process. The two co-authors who are also Portuguese-English bilinguals double-checked everything for accuracy.

As previously mentioned, participants also completed a Language History Questionnaire (Li, Sepanski & Zhao, 2006), which was designed to assess their experiences with the second language (English). For example, participants reported at what age they started learning English and how long they had been studying it. They were asked to estimate how often they communicated in English. Options allowed them to choose (codes): less than once or twice a year (1), once or twice a year (2), every few months (3), monthly (4), bi-weekly (5), weekly (6), several days per week (7), or daily (8). Also, participants were asked to rate their proficiency levels in English. Reading proficiency, writing proficiency, speaking proficiency, and speech comprehension were self-reported on a Likert scale, ranging from not literate (1) to very literate (10).

Intervention

In the 2-hour training session, participants in both languages of instruction groups learned that authors/writers usually use some type of structure to organize the information they are trying to convey. They were also taught that if the same structure is used in their own written recall, they will have better memory and comprehension of the text. Thus, students in both groups (e.g. training in English and Portuguese) learned to identify the five different types of structures and the several signal words that are associated with them. Then, students learned to use the structure of the text to identify the main idea(s) the writer is trying to convey. Next, students were instructed on how to use the same structure on their own written recall. Finally, students had a chance to practice identifying the structure and the main idea of comparison and problem-solution passages. Students also learned about how to deal with unorganized writers, by using the strategy to re-write a muddled text example.

Procedure

Students were approached to participate in the study one month into the semester. We visited both classrooms on the same date to ask for students' volunteered participation. Students willing to participate signed a consent form, filled out the LHQ and completed the pre-test. For the pre-test, students were instructed to read the passage (Fast Breeder Reactors; problem-solution) as if they were reading an article in a magazine or newspaper. They were also told that after reading for comprehension, they should write down everything they could recall about the text without looking back at it. They were asked to write in full sentences rather than listing items or using bullet points. Participants in both groups (English-training and Portuguese-training) read the text in English and were asked to write their recalls in English, to the best of their ability. The only instructional difference between the groups was the language used for training.

One week after the pre-test, we returned to the classrooms to deliver the training and administer the post-test. Participants in the English-training group were taught the structure strategy in English, while those in the Portuguese-training group were taught the strategy in Portuguese using the translated set of materials. In the English-training group, instructors solely used English to address the students, while instructors in the Portuguese-training group only addressed students in Portuguese. After the training, students completed the post-test (Solution for Supertankers; problem-solution) following the same procedures of the pre-test. Students then had a chance to ask questions about the study and were thanked for their participation.

Pre- and post- recall scores were coded independently by two research assistants, attaining an average inter-rater reliability score of $r = .82$.

Results

Data Coding

To assess whether the shorter TSS training led to significant improvements in text recall, participants' written recalls were analyzed through the Top-Level Structure (TLS) and Quality scoring systems (MEYER, 1985; MEYER & MEIER, 2008).

The TLS is a scoring system from 1 to 9 that assesses the degree to which readers successfully use the text's structure to organize information in their written recall. In order to code participants' recalls, careful examination of participants' answers was compared to the TLS standardized scale for problem-solution (MEYER & MEIER, 2008). To obtain high TLS scores participants did not have to correctly remember the content of the text, but they had to recall the correct structure and use appropriate signal words in their recalls.

A rating score of 9 is the equivalent to the most clearly and explicitly organized and signaled recall, using learned signal words at the beginning of text to introduce the problem, while then transitioning to the solution by also using signal words. A rating score of 5 acknowledges that the reader knows the

problem and solution; however, organizes the text into a different structure. Finally, a rating score of 1 refers to text that is unrelated to the passage.

The Quality scoring system ranges from 1 to 6 and is strictly related to the accuracy of recalls. Under problem-solution, this scoring system recognizes whether a person has identified the correct problem, correct solution, and correct cause of the problem.

A rating of 6 acknowledges the reader has successfully identified the cause of the problem, the problem itself, and the solution. A rating of 3 corresponds to a reader only correctly identifying the problem. While, a score of 1 shows that the reader did not identify the problem or the solution. For the Quality scoring system, contrary to TLS, participants needed to recall the correct content from the text.

Data Analysis

Shapiro-Wilk tests of normality on the dependent variables showed the data were not normality distributed; all significance levels below .05. We thus proceeded to conduct the analyses with non-parametric tests. Before analyzing the data, scores from each of the dependent variables that were at ceiling at pre-test were excluded. Thus, participants with a TLS score of 9 at pre-test were not included in the analysis of TLS scores (n = 7), resulting on a sample size of 35 for this score. None of the participants was at ceiling (i.e. score of 6) on the Quality score, thus these analyses included all 42 participants.

Wilcoxon Signed Ranks Tests were used to assess the improvement of each language instruction group (English or Portuguese) from pre- to post-test for each of the dependent variables. The analysis of TLS scores for the group which received instruction in English showed no improvement from pre- (M = 2.82, SD = 1.91) to post-test, (M = 4.24, SD = 2.97), z = -1.52, p > .05. For the group who received instruction in Portuguese, on the other hand, there was a slight increase in TLS scores from pre- (M = 3.11, SD = 2.08) to post-test (M = 4.67, SD

= 3.25), z = -1,89, p = .059. In the analysis of Quality scores, again, the group who received instruction in English did not show any increase in scores from, pre- (M = 3.08, SD = 1.66) to post-test (M = 3.0, SD = 1.98), z = -.238, p > .05. Finally, the group who received instruction in Portuguese showed an improvement in Quality scores from pre- (M = 2.28, SD = 1.32) to post-test (M = 3.61, SD = 1.91), z = -2.49, p < .05. These results suggest that instruction in Portuguese resulted in an improvement for participants' organization and quality of text recall, while English instruction did not produce any effects.

Next, we ran Mann-Whitney, between-subjects, tests to investigate group differences at pre- and post-test for both of the dependent variables. TLS results showed no differences in either pre- or post-test scores between the two language instruction groups, all p values > .05. Thus, at baseline, both groups had similar TLS scores. Similarly, there were no group differences in Quality scores at both pre- and post-tests, all p values > .05. See Table 2 for a summary of the TLS and Quality scores data across language of instruction groups.

Table 2. *TLS and Quality Ratings of Pre- and Post-Testing for Second Language Learners.*

	TLS				Quality			
	Pre-test		Post-test		Pre-test		Post-test	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
English-training	2.82	1.19	4.24	2.97	3.08	1.66	3.00	1.98
Portuguese-training	3.11	2.08	4.67	3.25	2.28	1.32	3.61	1.91

Discussion

Results from Experiment 1 show that the shorter version of TSS training was somewhat effective in improving participants' memory of reading material in the L2, when it comes to using the structure of the text to aid in recall (i.e. TLS scores) when instruction was given in Portuguese, the participants' L1. In other words, when taught in Portuguese, participants were able to

improve their comprehension and memory of reading material by using the structure of the text itself when writing their own recalls. The quality of their written recalls in the L2, on the other hand, improved significantly when participants were trained in Portuguese. Thus, the shorter version of the TSS training developed for this study seems to be at least somewhat efficient for teaching L2 learners of English with low-intermediate proficiency how to use the structure of text to improve their memory of reading material in the second language, as long as instruction is provided in the L1. The lack of results observed with the group who received instruction in English may be at least partially due to participants' proficiency level, which for this sample, was reported as low-intermediate. Training in English for the learners with limited proficiency, as we suggested earlier, may be too cognitively demanding and impact how much students benefit from training.

Therefore, to further investigate the efficacy of the shorter TSS version, we tested it with a sample of monolingual speakers of English for whom this language-continent cognitive load is not a problem.

Experiment 2

Results from Experiment 1 suggest that the shorter version of the TSS training is somewhat efficient in improving L2 text recall and comprehension for low-intermediate learners of English when administered in participants' L1. In Experiment 2, we wanted to further test the efficacy of the shorter version of TSS training with a group of high language proficiency readers. Therefore, we conducted the same 2-hour training session with monolinguals, native speakers of English. We expected an increase in comprehension and recall of text after training with the TSS.

Participants

Participants were 84 native speakers of English, students from Psychology and Anthropology courses at the Penn State University, Beaver campus. Six students were excluded from the sample because they reported to be native speakers of a language other than English (i.e. Korean, Navajo, Tagalog, Twi and Spanish), as well as using only their native language at home. Thus, the final sample consisted of 78 participants who reported being native speakers of English, and using only English to communicate at home. They reported using English on a daily

Table 3. *Monolinguals' Language History Questionnaire Data.*

	Monolinguals	
	M	*SD*
Age	21.96	4.99
Frequency using English	8.00	.00
English reading proficiency	9.55	1.20
English writing proficiency	9.26	1.39
English speaking proficiency	9.84	.41
English speech comprehension proficiency	9.81	.47
Mean English proficiency	9.70	.46
Age of acquisition of Spanish	14.51	3.63
Frequency using Spanish	3.67	2.45
Spanish reading proficiency	2.86	1.80
Spanish writing proficiency	2.35	1.53
Spanish speaking proficiency	2.62	1.82
Spanish speech comprehension proficiency	2.72	1.69
Mean Spanish proficiency	2.64	1.62

basis, and rated themselves very highly in their English proficiency [*M* = 9.7 (on a scale from 1-10), *SD* = .46]. Fifty-one

of the 78 participants were females, and the sample age ranged from 18 to 38 (*M* = 22.0, *SD* = 5.0).

Out of these 78 participants, 37 participants reported learning Spanish as a second language in school at around age 14 (*M* = 14.5, *SD* = 3.6). However, they only reported using Spanish every few months to monthly and self-rated their Spanish proficiency at low levels (reading: *M* = 2.9, *SD* = 1.8; writing: *M* = 2.3, *SD* = 1.5; speaking: *M* = 2.6, *SD* = 1.8 and speech comprehension: *M* = 2.7, *SD* = 1.7). Therefore, these participants were also considered English monolinguals and were included in the sample.

Materials and Intervention

The same materials and intervention used with the English experimental group of Experiment 1 were administered to participants in Experiment 2.

Procedure

The procedures were similar to Experiment 1. In Experiment 2, however, participants completed the questionnaire and pre-test on the same day as the intervention. Thus, when all participants arrived on the day of testing, they first completed the LHQ questionnaire (Li, Sepanski, & Zhao, 2006), and then proceeded to complete the pre-test. The intervention then followed for 2 hours, and finally participants completed the post-test. Two different research assistants coded participants' written recalls individually using the same scoring system from Experiment 1. Their coding resulted in an inter-rater reliability of *r* = .95.

Results

Data Analysis

Similarly to Experiment 1, a Wilcoxon Signed Ranks Test was used to evaluate if there was an improvement in participants' TLS and Quality scores from pre- to post-test. Again, scores

which were at ceiling at pre-test were excluded from analyses (*n* = 49 for TLS and *n* = 37 for Quality), resulting on a final sample of 29 participants for TLS analyses, and 41 for the quality analyses. Results show that for both TLS and quality scores there was no difference between the pre- (TLS: *M* = 3.97, *SD* = 2,85; Quality: *M* = 3.20, *SD* = 1.65) and post-test (TLS: *M* = 4.41, *SD* = 3.65; Quality: *M* = 3.63, *SD* = 2.03).

Table 4. *TLS and Quality Ratings of Pre- and Post-Testing for Monolinguals.*

	TLS				Quality			
	Pre-test		Post-test		Pre-test		Post-test	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Monolinguals	3.97	2.85	4.41	3.65	3.20	1.65	3.63	2.03

Discussion

Results from Experiment 2 suggest that the shorter version of the TSS training was not effective in improving a group of English monolingual students' recall and comprehension of text. This is a surprising finding given the positive results from Experiment 1 with a shorter version of TSS training, in which even second language learners of low-intermediate English proficiency were able to benefit from it. We address possible explanations to these findings in the general discussion.

General Discussion

Results from Experiment 1 partially supported our hypothesis that a shorter version of the TSS would improve readers' recall and comprehension of text in their second language (i.e. English). While the observed improvement in recall that is associated with use of text structure only approached significance, there was a statistical increase in the accuracy of recalls, but only for the group trained in Portuguese. Thus, our hypothesis that the language of instruction would affect the amount of improvement was partially supported. Supporting our

prediction, training in Portuguese might have freed up cognitive resources to allow for improvement in both text structure recall and accuracy. Training in English, on the other hand, is likely to have taken up more cognitive resources and interfered with participants' ability to increase the accuracy of their recalls. Perhaps more proficiency in English needs to be in place for L2 learners to fully benefit from the shorter version of TSS training. With increased proficiency more cognitive resources would be available for processing training instructions, which in turn, could lead to improvement in the accuracy of recalls as well. It is also relevant to note that in previous TSS studies with second language learners (e.g. CARREL, 1985; RAYMOND, 1993, YEH et al, 2011), learners consisted of intermediate to high proficiencies. Results from our study are in line with results from aforementioned second language studies in that we also observed an improvement in text recall after training with the text structure strategy.

Results from Experiment 2 failed to support our hypothesis. We expected to replicate findings from previous studies with a group of monolingual English speakers, and thus strengthen the validity of the shorter version of the TSS training, but found no improvement for either the TLS or the Quality scores. This was an unexpected finding given that the group of second language learners had showed improvement with the shorter version, even when they read texts in a weaker L2. There are a few possible explanations for these null results. One concerns methodological differences. While the second language learner group had a week's span between pre- and post-testing, the group of monolinguals did both testing sessions in the same day. Although the actual training time for both groups was the same, the monolingual group's overall session time was longer. Going through this longer session might have been too cognitively demanding, which in turn might have affected particularly their post-test performance, thus showing no improvement. Another possibility is that participants in the first experiment were more motivated to learn. Indeed, they were enrolled in English remedial courses that were designed to

improve their English skills. It is reasonable to assume then, that the second language learner group might have been more engaged in learning the strategy because it would benefit their overall goal of developing their English skills. Finally, it is possible that the shorter version of the TSS was simply not as effective as its longer and widely successful counterpart (see Meyer & Ray, 2011 for a review of the TSS literature). Although this would partially contradict results from Experiment 1, we should not discard such possibility, especially given the fact only Quality results for training in Portuguese were reliable above chance. It is possible therefore, that to fully exert its potential in improving readers' recall of text, the strategy needs to be taught in multiple sessions, and include homework assignments as well as more in-class activities.

Despite these limitations, the present study provides insight to a number of issues that teachers and learners of a second language may face. For example, this study demonstrates that even learners with low-intermediate proficiency will benefit from brief training on a strategy to improve their text recall in a second language. This is highly relevant for educational institutions that deal with a great number of students, of varied proficiency levels, as is the case of the institution where Experiment 1 was conducted. Teaching those students the TSS strategy provided them with important tools to further develop their efforts in learning a second language. Although a full-blown TSS intervention may have been ideal, this shorter version was sufficient to give these students a head start. It would be interesting for future studies to accompany the development of students that were trained in the TSS and compare their performance in English language tasks to students who did not receive the training. Similarly, in future research, we should conduct multiple post-test sessions to assess retention of usage for the TSS.

Another issue this study provides insight to is the matter of language of instruction. At a low-intermediate level, learners were not able to benefit from training and improve text recall when taught in English, their second, "in development" language.

This finding alone has huge implications for how second languages are taught in a formal classroom setting. It suggests that the first language may aid instruction in second language at least at lower proficiency levels. Such suggestion finds support in psycholinguistics research, which has now consistently shown that bilinguals never really turn off one of their languages (e.g., DE BRUIN, DIJKSTRA, CHWILLA & SCHRIEFERS 2001; DIJKSTRA, DE BRUIJN, SCHRIEFERS, & BRINKE 2000; DIJKSTRA & VAN HELL, 2003; GOLLAN, FORSTER, & FROST, 1997; JARED & KROLL, 2001; VAN HEUVEN, DIJKSTRA, GRAINGER, & SCHRIEFERS, 2001; SCHWARTZ, KROLL, & DIAZ, 2007). Therefore, it may be beneficial to use the first language as a tool to teach the second language in the classroom. Nevertheless, it is important to understand at which level learners can be taught effectively in the second language. The findings from this study imply that such level may be at later acquisition stages, past low-intermediate proficiency levels.

In future research, we plan to address some of the questions raised in this study to more thoroughly test the efficacy of the shorter TSS training version. For example, by including a wider range of proficiencies in the second language we will be able to address whether improvements in TLS and Quality scores depend on higher proficiencies in the second language. In addition, by measuring participants' motivation to learn, we can address whether any effects found with second language learners but not with monolinguals are due to such variables. It would also be interesting to look for other individual differences that may affect learners' ability to improve recall and comprehension of text, such as working memory capacity. There is a large body of evidence suggesting that readers with high working memory capacity are better at text comprehension (DANEMAN & CARPENTER, 1980; DANEMAN & CARPENTER, 1983; KING & JUST, 1991). In future studies, we should address whether individual differences in working memory capacity also have an effect on learning and using the text structure reading strategy.

In conclusion, in spite of the initial positive results of a shorter version of the TSS training for second language learners, more research needs be conducted to further assess its efficacy and establish its reliability. Nonetheless, these initial findings have direct applications to the field of bilingualism, in respect to second language teaching and learning.

Referências

AGOR, J. Language-learner strategy instruction and English achievement: Voices from Ghana. *English Language Teaching*, 7 (6), 175-191.

BARNETT, M. A. (1988). Reading through context: How real and perceived strategy use affects L2 comprehension. *Modern Language Journal*, 72 (2), 150, 1988.

BRISBOIS, J. Connections between first- and second-language reading. *Journal of Literacy Research*, 27 (4), 565-584, 1995.

BRITTON, B. K., GLYNN, S. M., MEYER, B. J., & PENLAND, M. J. Effects of text structure on use of cognitive capacity during reading. *Journal of Educational Psychology*, 74 (1), 51-61, 1982.

BROER, N. A., AARNOUTSE, C. A. J., KIEVIET, F. K., & LEEUWE, J. F. J. (2002). The effect of instructing the structural aspect of texts. *Educational Studies*, 28, 213- 238.

CARRELL, P. L. Facilitating ESL reading by teaching text structure. *TESOL Quarterly***,** 19 (4), 727-752, 1985.

CARRELL, P., & EISTERHOLD, J. Schema theory and ESL reading pedagogy. *TESOL Quarterly*, 17 (4), 553-553, 1983.

COHEN, Andrew D. *Strategies in learning and using a second language*. Harlow, England: Longman, 1998.

COOK, L. K., & MAYER, R. E. Teaching readers about the structure of scientific text. *Journal of Educational Psychology*, 80, 448-456, 1988.

DANEMAN, M. & CARPENTER, P. A. Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior*, 19, 450-466, 1980.

DANEMAN, M., & CARPENTER, P. A. Individual differences in integrating information between and within sentences**.** *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9(4), 561-584, 1983.

DANSEREAU, D. F., COLLINS, K. W., MCDONALD, B. A. HOLLEY, C. D., GARLAND, J.C., DIEKHOFF, G., & EVANS, S. Development and evaluation of an effective learning strategy program. *Journal of Educational Psychology*, 71, 64-73, 1979.

DE BRUIJN, E. R. A., DIJKSTRA, T., CHWILLA, D. J., & SCHRIEFERS, H. J. Language context effects on interlingual homograph recognition: Evidence from event-related potentials and response times in semantic priming. *Bilingualism: Language and Cognition*, 4(2), 155-168, 2001.

DIJKSTRA, T., DE BRUIJN, E., SCHRIEFERS, H., & BRINKE, S. T. More on interlingual homograph recognition: Language intermixing versus explicitness of instruction. *Bilingualism: Language and Cognition*, 3 (1), 69-78, 2000.

DIJKSTRA, T., & VAN HELL, J. G. (2003). Testing the language mode hypothesis using trilinguals. *International Journal of Bilingual Education and Bilingualism*, 6 (1), 2-16, 2003.

EDUCATION FIRST ENGLISH PROFICIENCY INDEX. EF education first: The world leader in international education. Retrieved from http://www.ef.com.

FLY, J. B. JEAN, P. & HUNTER, B. Teaching students to construct graphic representations. *Educational Leadership*, 46 (4), 20-25, 1988.

GEVA, E. (1983). Facilitating reading through flowcharting. *Reading Research Quarterly*, 18, 384-405, 1983.

GOLLAN, T. H., FORSTER, K. I., & FROST, R. Translation priming with different scripts: Masked priming with cognates and noncognates in Hebrew English bilinguals. *Journal of Experimental Psychology: Learning, Memory, and Cognition,* 23, 1122-1139, 1997.

HOLLEY, C. D, DANSEREAU, D. F., MCDONALD, B. A., GARLAND, J. C., & COLLINS, K. W. Evaluation of hierarchical mapping techniques as an aid to prose processing. *Contemporary Educational Psychology*, 4, 227-237, 1979.

JARED, D., & KROLL, J. F. Do bilinguals activate phonological representations in one or both of their languages when naming words? *Journal of Memory and Language*, 44 (1), 2-31, 2001.

JEON, E. H., & YAMASHITA, J. L2 reading comprehension and its correlates: A meta-analysis. *Language Learning*, 64 (1), 160-212, 2014.

KING, J., & JUST, M. A. (1991). Individual differences in syntactic processing: The role of working memory. *Journal of Memory and Language*, 30 (5), 580-602, 1991.

KODA, Keiko. The use of L1 reading strategies in L2 reading. *Studies in Second Language Acquisition*, 12, 393-410, 1990.

KODA, Keiko. Transferred L1 strategies and L2 syntactic structure in L2 sentence comprehension. *The Modern Language Journal*, 77 (4), 490-500, 1993.

KODA, Keiko. Reading and Language Learning: Crosslinguistic Constraints on Second Language Reading Development. *Language Learning*, 57 (1), 1–44, 2007.

LEÓN, J. A., & CARRETERO, M. Intervention in comprehension and memory strategies: Knowledge and use of text structure. *Learning and Instruction*, 5, 203-220, 1995.

LI, P., SEPANSKI, S., & Zhao, X. (2006). Language history questionnaires: A web-based interface for bilingual research. *Behavioral Research Methods*, 38, 202-210, 2006.

MEDE, E. The effects of instruction of graphic organizers in terms of students' attitudes towards reading in English. *Procedia Social and Behavioral Sciences*, 2, 322–325, 2010.

MEYER, B. J. F. Prose analysis: Purposes, procedures, and problems. In B. K. Britton, & J. Black (Eds.), *Analyzing and understanding expository text*, Hillsdale, NJ: Erlbaum, 1985. pp. 11-64, 269, 304.

MEYER, B. J. F., BRANDT, D. M., & BLUTH, G. J. Use of the top-level structure in text: Key for reading comprehension of ninth-grade students. *Reading Research Quarterly*, 16, 72-103, 1980.

MEYER, B. J. F., & FREEDLE, R. O. Effects of discourse type on recall. *American Educational Research Journal*, 21, 121-143, 1984.

MEYER, B. J. F. & MEIER, C. *Scoring Manual for Top-Level Structure (TLS) and Quality of Recalls*. Technical Report No. 4 of the Reading Comprehension: Structure Strategy Series. University Park, PA: Penn State, 2008.

MEYER, B. J. F., MIDDLEMISS, W., THEODOROU, E., BREZINSKI, K. L., MCDOUGALL, J., & BARTLETT, B. J. Effects of structure strategy instruction delivered to fifth-grade children using the Internet with and without the aid of older adult tutors. *Journal of Educational Psychology*, 94, 486-519, 2002.

MEYER, B. J. F., & POON, L. W. Effects of structure strategy training and signaling on recall of text. *Journal of Educational Psychology*, 93, 141-159, 2001.

MEYER, B., & RAY, M. Structure strategy interventions: Increasing reading comprehension of expository text. *International Electronic Journal of Elementary Education*, 4 (1), 127-152, 2011.

MEYER, B. J. F., TALBOT, A. P., POON, L. W., & JOHNSON, M. M. Effects of structure strategy instruction on text recall of older African American adults. In J. L. Harris, A. Kamhi, & K. Pollock (Eds.), *Literacy in African Americans communities*. Mahwah, NJ: Erlbaum, 2001. pp. 233-263.

MEYER, B. J. F., & WIJEKUMAR, K. A Web-based tutoring system for the structure strategy: Theoretical background, design, and findings. In D. S. McNamara (Ed.), *Reading comprehension strategies: Theories, interventions, and technologies.* Mahwah, New Jersey: Lawrence Erlbaum Associates, 2007. pp. 347-375.

MEYER, B. J. F., WIJEKUMAR, K.K., LIN, Y. Individualizing a web-based structure strategy intervention for fifth graders' comprehension of nonfiction. *Journal of Educational Psychology*, 103, 140-168, 2011.

MEYER, B. J. F., YOUNG, C. J., & BARTLETT, B. J. *Memory improved: Enhanced reading comprehension and memory across the life span through strategic text structure*. Hillsdale, NJ: Lawrence Erlbaum, 1989.

PRESSLEY, M., & MCCORMICK, C. *Cognition, teaching, and assessment*. New York: HarperCollins College Publishers, 1995.

RAYMOND, P. M. The effects of structure strategy training on recall of expository prose for university students reading French as a second language. *The Modern Language Journal*, 77, 445-458, 1993.

SCHWARTZ, A. I., KROLL, J. F., & DIAZ, M. Reading words in Spanish and English: Mapping orthography to phonology in two languages. *Language and Cognitive Processes*, 22 (1), 106-129, 2007.

SCHWARTZ, A. I., MENDOZA, L., MEYER, B. The impact of text structure reading strategy instruction in a second language: benefits across languages. *The Language Learning Journal*, 2013.

SCIENCE WITHOUT BORDERS: THE BRAZILIAN SCIENTIFIC MOBILITY PROGRAM. A New Step in Brazilian Science. Retrieved from www.access4.eu/_media/2011_science_without_borders.

VAN HEUVEN, W. J. B., DIJKSTRA, T., GRAINGER, J., & SCHRIEFERS, H. (2001). Shared neighborhood effects in masked orthographic priming. *Psychonomic Bulletin and Review*, 8 (1), 96-101.

YEH, L., SCHWARTZ, A. I., & BAULE, A. L. The impact of text-structure strategy instruction on the text recall and eye-movement patterns of second language English readers. *Reading Psychology*, 32(6), 495-519, 2011.