

# **New Life for Text Reconstruction Exercises**

Nicholas A. Bufton

Kyoei University

David A. Gann

Tokyo University of Science

## **Abstract**

In dedicated critical thinking classes for second language learners at a Japanese university, a combined podcast and text reconstruction exercise (TRE) program was used for developing learners' understanding of the structure of argument. This pioneering pilot study assesses how the location of breakpoints in TREs had an effect on peer-to-peer interaction and discussion times, and on the outcome of examination results. The present study compared two critical thinking classes. One class ( $n = 8$ ) engaged in text reconstruction exercises where the majority of breakpoints were made at the intra-sentence level, and along grammatically dictated breakpoints; and the other class ( $n = 10$ ) engaged in TREs where breakpoints were put at the inter-sentence or full clause level. The effects of these differing breakpoints on identical texts and test questions were examined. The results indicate that breakpoints placed at full clause and inter-sentence points, rather than at grammar dictated points, lead to better argument parsing skills. As a pilot study, these results will need to be replicated, and an investigation into whether these improvements translate into more usable, and long lasting real world skills will also be required.

**Key words:** critical thinking tasks, arguments in syllogistic form, noticing, text reconstruction exercises, breakpoint placement, premise and conclusion indicators, recognizing and parsing an argument.

## **1. INTRODUCTION**

The understanding of argument, and argumentative writing, is central to critical thinking (Dick, 1991) and advanced level English courses. Furthermore, the ability to

evaluate information critically is a contributory factor in academic success (McCutcheon *et al*, 1992; Tsui, 2002; Yeh & Wu, 1992). Critical pedagogy and critical language awareness in the area of language learning have been considered essential concepts in both language learning and language teaching (Norton & Toohey, 2004). Dabaghi, Zabihi, & Rezazadeh (2012), and Hashemi & Zabihi (2012), contend that there is a significant correlation between the development of critical thinking skills, and English proficiency scores on written tasks. Dabaghi *et al* (2012) also argue that logical skills, making inferences, and identifying assumptions all correlated with higher overall academic scores and conclude that there is a significant correlation between critical thinking skills such as deduction and interpretation of evidence and the evaluation of premises and conclusions with achievement on written tasks requiring logical reasoning.

For the second language learner, the cognitive demands related to the understanding of argument can be quite overwhelming, especially when constrained by curriculum and class-time limitations. Even if the allotted number of lessons for the instruction of argument were exceeded, this would not guarantee that argumentative form and its essential elements would be recognized, or learnt.

The authors have found it difficult to raise learners' competence and understanding of the structure of argument to a level where they are ready to transcend the declarative stage. And that explicit instruction in Japanese, the *lingua franca* of the authors' classrooms, more often than not, also failed to adequately prepare learners with the skills to recognize and parse an argument in the target language. Thus, in an attempt to support and guide learners through the principal elements of argument or logically persuasive writing, the authors complemented explicit instruction with an inductive approach to the teaching of the elements of argument.

This study investigates the value of computer-based text reconstruction exercises (TREs) as part of a chain of tasks aimed at developing learners' awareness of form through the identification of metalinguistic features, lexical items, and textual patterns prevalent in argument. And more specifically on the use of inter and intra-sentence breakpoints in TREs designed to demonstrate the structure of argument. The effects of using differing breakpoints on identical texts and test questions were examined, as were the differing peer-to-peer interaction and discussion times. The results indicate that breakpoints placed at full clause and inter-sentence points, rather than at grammar-dictated points, lead to better argument parsing skills, and improved examination results.

## 2. BACKGROUND

### 2.1 Understanding argument and the second language learner.

In 2010, the authors began production of the *Critically Minded Podcast*. The episodes were developed to support the teaching of critical thinking by offering a condensed version of the core material being taught, or as an expansion or synopsis of the materials distributed in the classroom. In its entirety, the 13-episode series explores various aspects of critical thinking. However, during the first weeks of the course, only the introductory episodes are studied, and these cover no more than the analysis, understanding, and evaluation of the components of argument.

Traditionally, the teaching of critical thinking has been through the use of academic tasks that require higher order processing skills. However, the question of whether a critical thinking task accomplishes its goal by developing reasoning skills depends very much on the task's design, and its management in the classroom. The quality of learning, and use of critical thinking skills, is very much determined by the way in which learners work through a task rather than by the task's outcome (Grant p.p. 90~91, 1988). Tasks may be of the traditional teacher guided Socratic discussion/class debate type or computer-based simulations designed to give learners an equal opportunity to practice and refine their higher-order thinking strategies (Quinn, 1993). Current computer-based tasks such as argument mapping through such software as Reason!Able© (Van Gelder, T. 2000; Twardy, C. 2004) or computer mediated discussion groups (Greenlaw, S. A. & Deloach, S. B. 2003) are becoming common place. But for the second language learner (SLL), it can be quite complex to judge whether an argument is faulty or indeed, a persuasive one or not. The reader needs to differentiate between what is said, what is assumed, and what the context is. In addition, he or she may also need a degree of expert or cultural knowledge, and a willingness to engage in a little research. That said, it is also clear that an argument cannot be evaluated until the reader can identify what the elements of an argument are, and how to evaluate them (Fisher p.32, 2001, Brown & Keeley, p.27, 2004). Thus, for the SLL a focused step-by-step task that allows her/him to quickly try out their hypotheses without cognitive overload would seem to be the optimal method. This is because the amount of cognitive effort expended, is an appropriate measure of motivation as it relies on the learners' focusing on mastering the task and maintaining a high sense of personal success (Stoney & Oliver, 1999; Sweller, 1994).

Working under the aegis that argument is both a set of abstract principles as well as the lexical, structural and organizational patterns that give it form, the authors approach argument as a cognitive skill set. The development of this skill set follows two stages (Anderson, J. R. 1982): the declarative stage, whereby the explicit knowledge of the structure of argument, and the textual features associated with argument such as issue indicators, premise indicators and conclusion indicators are noticed; and the procedural stage, in which this knowledge is pressed into service. It is with how best to help learners reach this declarative stage that the authors were concerned when they explored the use of text reconstruction tasks.

## 2.2 Text reconstruction exercises – the backstory

The value of TREs in language teaching methodology has been recognized since the late 1980s. Second language acquisition (SLA) theory suggests that explicit knowledge functions as a facilitator of implicit knowledge by making learners aware of linguistic features that may otherwise be ignored. It also suggests that tasks that stimulate metalinguistic insight, and the registration of patterns in the construction of language can be integrated into learners' interlanguage through either teacher-guided or student-initiated 'noticing' (Schmidt, 1990; 1993a; Brett, 1994; Thornbury, 1997). In an effort to afford students an opportunity to 'notice' particular features within a text, the authors designed and put into effect a series of computer-based TREs.

Of the various software available: *Hot Potatoes* – a suite of programs published by Victoria University and Half-Baked Software – was selected (*Fig. 1*), as it is known to be a stable and secure platform. It has a simple interface that is easy for students to use, and a results and data page that can be easily downloaded by the teacher.

When teaching argument, it is often necessary to focus learners' attention on the components and internal structure of argumentation. The authors observed that TREs were an effective medium for aiding learners in achieving the sustained engagement with the targeted discourse that is required for quality noticing. Observation also confirmed what social constructivist theory (Vygotsky, 1978) suggests – that having learners work on TREs in pairs is better than having them working alone, as it enables collaborative interaction.

Our downloaded records of students' performance also supported the value of collaborative interaction, in that solitary learners often tend to give up on the task, and begin clicking on options at random in an effort to expedite completion of the task. While in pairs,

it was observed that learners were more likely to discuss and negotiate the multiple options.

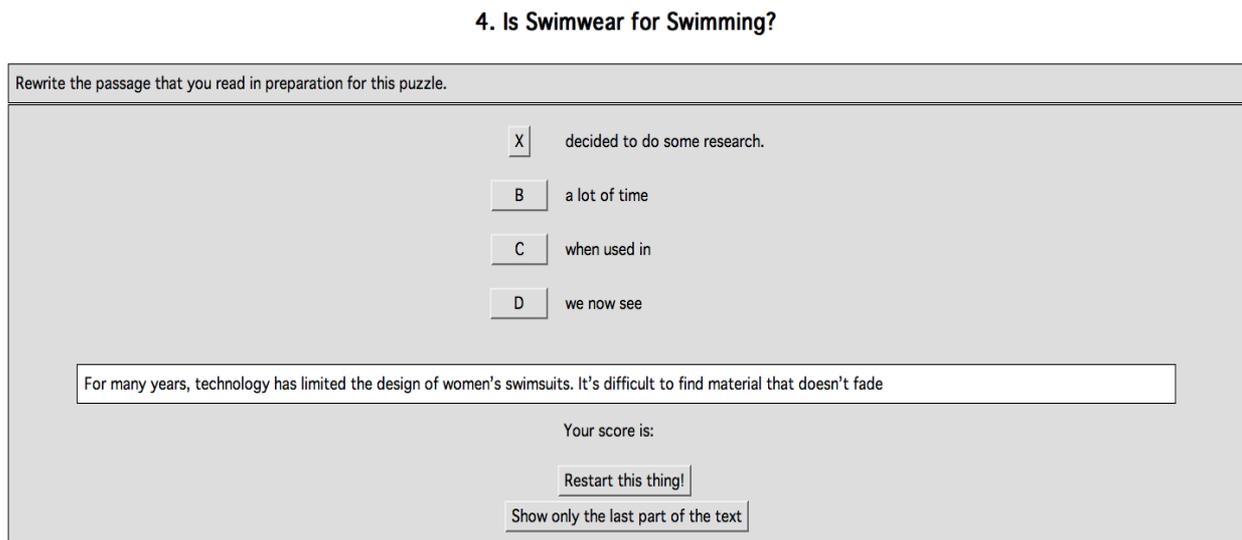
Whether such negotiation is done in the target language or not is of little importance as long as learners use their full store of linguistic knowledge to its fullest potential. In addition, code switching can be exploited by both the teacher, as part of the teaching methodology, as well as by learners, as a communicative strategy (Cook, 2001; Faerch and Kasper, 1983). Moreover, during small-group discussions, learners' increased motivation is sustained as students develop a sense of community by interacting with each other (Rovai, 2002). Hence, as the tasks used in the authors' classes were designed to promote scaffolding through interaction, and move learners from their existing level of performance to a level of potential performance, the L1/L2 interactional balance was considered to be of little consequence (Cook, 2001; Hyland, 2006).

As the authors' use of TREs is largely predicated on the importance of noticing, several questions concerning noticing should be considered. Some theorists have questioned the efficacy of Schmidt's '*Noticing Hypothesis*' (1990) with regards to the acquisition of grammatical ability. Truscott (1998) argues that many of the claims for the *strong hypothesis* advanced by Schmidt are supported neither in theory nor by empirical data. Truscott asserts that these claims rely on either the inconclusive or insignificant results of only handful studies. He also argues that textual features such as grammatical or syntactical forms do not need to be noticed at a level of conscious understanding for learning to occur. It is enough for learners to simply be aware of them. Thus, using tools like TREs toward developing the noticing of grammatical and syntactical textual features at a conscious level may be a misapplication. Truscott cites studies of the long-term retention of grammatical and syntactical knowledge, which show that the benefits of noticing had dissipated after some months. That said, however, Truscott does support claims for the *weak hypothesis* in that conscious noticing developed through form-focused feedback and instruction aimed at increasing learners' awareness of form correlates more closely with the acquisition of metalinguistic knowledge (Truscott p.p. 123-124).

Unfortunately, no conclusive studies have been done on the long-term retention of metalinguistic knowledge acquired through noticing tasks, such as text reconstruction. Truscott is also quick to point out that more studies are required to test both the strong and the weak hypothesis. If the strong hypothesis is supported, then the authors' use of TREs would be supported by the status quo. However, if further research supports only the weak hypothesis, then the way in which the authors use TREs to scaffold the conscious

metalinguistic knowledge of argument and its structures would put their use amongst the few legitimate uses of text reconstruction exercises. For now, all that can be said is that further empirical research is necessary.

Figure. 1: Text Reconstruction Screen Shot



Culturally based differences and perceptions related to the value of critical thinking in academic work were also considered; and the manner in which to best approach them so that learners do not feel culturally or academically compromised (Egege & Kutieleh, 2003) was also acknowledged. However, as the focus of this study is on learners' understanding of the structure and organization of argument in English – and not its application – the complexities of varying cultural traditions were regarded as a common hurdle for all learners alike to overcome.

### 3. OUTLINE OF TEACHING METHOD

Two classes of university students who had elected to take a course titled 'Basic Critical Thinking' were used in this study. Both classes discussed in this paper followed the same curriculum content regarding argument. The teaching methodology used was a four-stage process (Gann and Bufton, 2012) whereby the bulk of instruction in argument is delivered out of class via podcast. Students are given one week in which listen to each podcast, and make notes. A transcript of the podcast is also available online. Following the

podcast, in-class discussion/question and answer session is held to recap or clarify the podcast's content. This is then followed by TREs related to each podcast. Depending on the class time available, these exercises may be performed within the same class period or the following week. Lastly, the skills learned in the preceding stages are put to use in an assignment. The content of this assignment can be tailored to match the students' area of study. These assignments are then followed by in or out of class (on-line) computer-mediated discussion threads to consolidate the knowledge gained.

#### **4. TREs AND THE RATIONALE FOR THE MOVE FROM INTRA TO INTER-SENTENCE BREAKPOINTS**

In order to help students recognize the need for the knowledge of logical organizational patterns and the metalanguage with which to speak about argument, a series of TREs was designed to help students notice argument type; its structure and the relationship between sentences and paragraphs. This was achieved by producing a series of example logical arguments following the premise/conclusion or conclusion/premise format. The sample arguments used in the first two sets are highly structured and straightforward. This is to familiarize the students with the exercises and instill confidence. The texts become increasingly longer to the effect that students can no longer commit reading passages to memory. Thus, they must rely on specific salient textual features to guide their reconstruction efforts. In addition, the complexity of the reading passages also increases so that completing the exercises requires more persistent engagement. For example, in the first two TRE sets, (*example A*), the premise indicators are limited to *because* and *since* and conclusion indicators are limited to *so*, *therefore*, *thus*, *hence*, *which indicates* and *This points to*.

##### **Example A: Introductory TREs From Sets 1 and 2**

*(Note: the slash (/) marks the breakpoints used in the reconstruction exercise.)*

1. The dog / only / barks when / a stranger / comes to the front door. The dog / is barking / now. Therefore, / there is a stranger / at the front door.
2. There is a footprint / on the window / sill, which / indicates that / the thief came in / through the window.

3. All the members of the student baseball club / signed the petition / calling for the meeting / with the university administration. However, / none of the soccer club / members did so. Since Kenji's / signature appears on the petition, / he must be a member of / the student baseball club, / and not / the soccer club.

Later, in the third, fourth, and fifth sets, premise indicators such as *first* and *second* are introduced as well as phrases such as *it was discovered that*, *it was assumed*, *I believe this happens for two reasons* and more extended constructions such as *given that x, then y*. Conclusion indicators introduced include *that is why*, *for that reason* and *Consequently*.

In the pre 2012 TREs, phrasal categories, familiar language chunks, and punctuation marks were used as locations for breakpoints. While these breakpoints broke the texts into conveniently short sections for the purpose of reconstruction, it was discovered that there were a number of unintended consequences. Through classroom observation and enquiries into how students were approaching the exercises, it was discovered that participants were more focused on grammar than they were with the progression and structure of the argument, and that punctuation marks and capital letters were being used as shortcuts to completing the TREs.

Once we became aware of this, the breakpoints in the longer TREs were modified (*For a comparison see examples B and C*). Breakpoints were put in at longer intervals, and before punctuation marks. This significantly reduced the likelihood participants choosing an option solely because the last sentence ending was clearly marked by a period, and only one of the four initial options offered by the TRE program begins with a capital letter.

In the 2012 TREs, the breakpoints steadily become further apart from the third set through to the fifth set. By the fifth set, almost all breakpoints are at the full phrase, embedded sentence, or full sentence level. This is to encourage the learner to better recognize the inter-sentence relationships, the logic of paragraphs, and how various indicators mark important elements and links within an argument.

Example B: 'Is Swimwear for Swimming?'

(*A set 3 exercise used by class A in the 2011 TREs.*)

For many years, / technology has limited the design of women's swimsuits. / It's difficult to find material that doesn't fade / when used in / seawater and swimming pool water. / The material has to be light in weight, / stretchy, / and

able to hold printed patterns / or dyes. Manufactures used to spend / a lot of time / and money / trying to develop / suitable materials. Then someone / decided to do some research. / One / of the questions asked / was how many times a season do you swim in your swimsuit? / The answer was a surprise. / Manufactures discovered that / 90% of women never went swimming. / Most women / only ever used / their swimwear / for sunbathing. The word ‘swim’ in swimsuit so strongly suggested / that they were for swimming in / that everyone assumed / that is what they were used for. / No one ever questioned whether / women actually wore swimsuits for swimming. / And that is why / we now see / women's swimwear / with labels inside marked: / “Not for swimming. /Dry clean only”.

Example C: ‘Is Swimwear for Swimming?’

*(A set 3 exercise used by class B in the 2012 TREs. Demonstrating the transition from intra to inter-sentence breakpoints.)*

For many years / , technology has limited the design of women’s swimsuits / . It’s difficult to find material that doesn’t fade when used in / seawater and swimming pool water / . The material has to be light in weight, stretchy / , and able to hold printed patterns or dyes / . Manufactures used to spend a lot of time / and money / trying to develop suitable materials / . Then someone decided to do some research / . One of the questions asked was / how many times a season do you swim in your swimsuit / ? The answer was a surprise / . Manufactures discovered that / 90% of women never went swimming / . Most women / only ever used their swimwear for / sunbathing / . The word ‘swim’ in swimsuit so strongly suggested / that they were for swimming in / that everyone assumed / that is what they were used for / . No one ever questioned whether / women actually wore swimsuits for swimming / . And that is why / we now see women's swimwear / with labels inside marked: / “Not for swimming . Dry clean only”.

## **5. THE PRESENT STUDY**

The authors conducted the present pilot study to investigate whether or not the placement of breakpoints in a TRE has any significant effect on the outcomes of the exercises. The final examination results of class A and B were used as a measure, and the times taken to complete each task were compared.

The texts used in the TREs for both classes were identical. Only the number and position of the breakpoints differed. One class (A) received TREs where the breakpoints were made according to established grammatical structures and punctuation points, and the second class (B) received TREs where the breakpoints had been made before punctuation marks, before and after whole phrases, embedded sentences, or complete sentences. By the fifth set of TREs, breakpoints were placed at points that fulfilled an argumentative function such as indicating a premise or linking a premise logically to a conclusion. The length of the text between breakpoints in TRE sets one and two were unchanged in order to lessen the cognitive load, and to allow the participants to familiarize themselves with the exercises.

## **6. RESEARCH QUESTIONS**

This study explores two questions:

1. Is there a difference in outcomes when measured by an end of semester examination?
2. Do the location breakpoints and the length of text between those breakpoints have an effect on the time taken to complete a task?

## **7. METHOD**

### **7.1 Participants**

A total of 22 students majoring in International Business Management at a Japanese university took part in the study. Two students from class A and three students from class B, completed the TREs, but dropped out before the final examination. Thus, the adjusted number of participants is 17. All were third-year students. Class A and B included Japanese and non-Japanese nationals.

Class A ( $n = 8$ ; 2 male, 6 female; 3 Japanese, 1 Korean, and 4 Chinese students): TREs using grammatically dictated breakpoints or punctuation marks. Class B ( $n = 9$ ; 4 male, 5 female; 4 Japanese, 1 Thai, 4 Chinese students): TREs using breakpoints that were predominantly placed before and after complete sentences or embedded sentences.

The two classes were similar, in that they were of mixed ethnicity. Data from their first-year English placement tests confirmed that all participants were in the top 20% of their respective cohorts. There was also no significant difference in placement test scores between the two groups. Both groups of students had attained an above average score in their previous English classes, as admission to the critical thinking course requires participants to have previously received a grade A in both General English, and Practical English Conversation.

## 7.2 Method

All participants in the study followed the same syllabus content and method of instruction. Classes met for 90 minutes once a week. The period over which the instruction of argument is taught is three weeks. Tracking confirmed that all participants had accessed the podcasts as required. Class A was held in the second semester of 2011 and class B was held in the first semester of 2012. None of the students in either group were absent during instruction period, and 17 out of 22 that started the courses took the final examination as scheduled.

All text reconstruction exercises were conducted in the same computer laboratory. Students worked in pairs at completing the TREs. The software used logs the length of time taken to complete each TRE, and the number of attempts made in reconstructing the text. However, the computer time logs are of little value as students were often observed taking breaks in the middle of an exercise to do other things, for example, check their smartphones. Thus, video recordings were made. The purpose of these were to keep a log for later evaluation, and to encourage the participants to focus on the exercises. Due to classroom logistics, only four complete recordings have been selected to confirm task times and process.

The two TREs with the best video data were selected in order to compare the time taken to complete the tasks. These were '*Is swimwear for swimming?*' from set C and '*Traffic accident, Witnesses A & B combined*' from set F. The use of English was encouraged, but not

compulsory. There are 27 TREs in total. The number of TREs completed by all the students in both classes was nineteen.

The section in the final examination covering the metalanguage and analysis of argument, requires the parsing and labeling of 4 sample arguments and is worth 25 marks in total (*See figure 2*). Question one consists of one argument and is worth 3 marks. Question two and three are both worth 6 marks each. Question four consists of an argument and counter-argument within the same paragraph, and is worth 10 marks.

Figure. 2: Sample of a Student's Attempt at an Argument Parsing Question

Many environmentalists believe that the Toyota Prius is an environmentally clean car (because) it gets good gas mileage. However, when you consider the cost of mining the nickel to make the batteries, the cost shipping each car from Japan to other countries, and the recycling costs at the end of the car's life it is in fact, not very environmentally friendly.

*Handwritten annotations:*  
 - "because" circled, with "Conclusion 結論" written below it.  
 - "However," circled, with "反对意见" written below it.  
 - "it is in fact," circled, with "结论" written below it.  
 - "Conclusion 結論" written above the second sentence.  
 - "P1" written above "when you consider...".  
 - "P2" written above "it is in fact...".  
 - "P3" written above "not very environmentally friendly...".  
 - "前提 P" written below "gets good gas mileage".  
 - "结论 conclusion" written below "not very environmentally friendly".

## 8. DATA AND ANALYSIS

### 8.1 Regarding the Difference in Outcomes When Measured by an End of Semester Examination

While the data presented is basic, it does suggest that the use of TREs, with breakpoints at the sentence or full phrase level, have an effect on students' ability to successfully parse the arguments presented in their final examination. A two-sample *t*-test was not performed as the number of participants in both classes is so small that it is doubtful that anything of value would be obtained.

The difference in performance (*See Tables 1a and 1b*) between class A (2011) and class B (2012) on their final examination shows that, on average, class B made an overall gain on all four argument questions. Increases made by class B in relation to A are in

percentage points. Qu. 1. 15.7% ; Qu. 2. 11.8%; Qu.3. 27.8%; and Qu.4. 17.2%. (See also Table C)

Tables 1a and 1b

**Table 1a: Examination Results Class A (2011)**

Student	Score		Qu. 1	Qu. 2	Qu. 3	Qu. 4
25			3	6	6	10
1	15	60%	2	4	3	6
2	20	80%	2	5	5	8
3	16	64%	3	4	3	6
4	15	60%	3	4	3	5
5	10	40%	1	2	3	4
6	13	52%	1	3	3	6
7	12	48%	2	4	2	4
8	10	40%	0	3	2	5
<b>Average</b>		<b>56%</b>	<b>1.75</b>	<b>3.63</b>	<b>3.00</b>	<b>5.50</b>
			<b>58%</b>	<b>60%</b>	<b>50%</b>	<b>55%</b>
<b>SD</b>			<b>0.97</b>	<b>0.86</b>	<b>0.87</b>	<b>1.22</b>

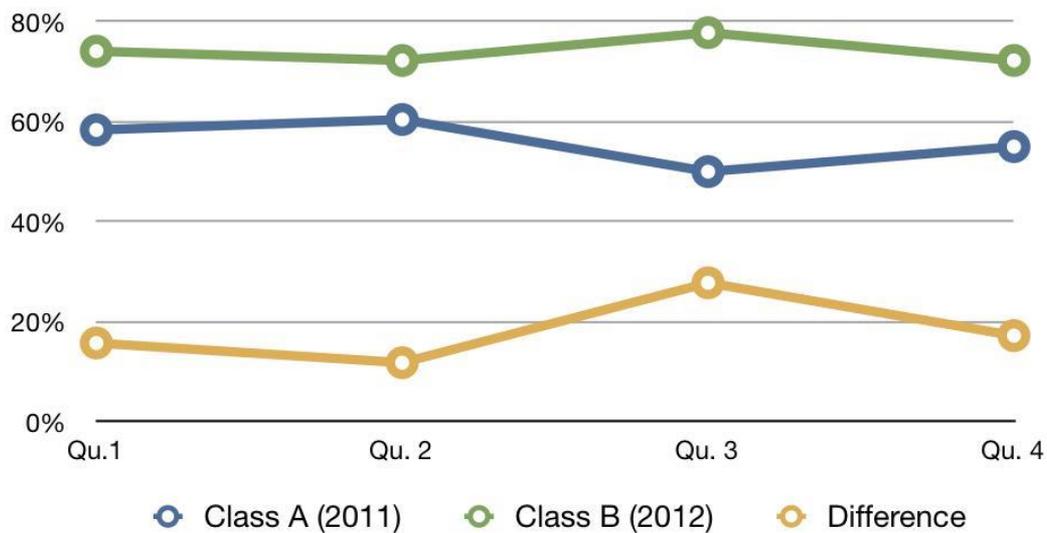
**Table 1b: Examination Results Class B (2012)**

Student	Score		Qu. 1	Qu. 2	Qu. 3	Qu. 4
25			3	6	6	10
1	18	72%	2	5	4	7
2	20	80%	2	4	6	8
3	22	88%	3	5	6	8
4	22	88%	3	5	5	9
5	20	80%	2	6	4	8
6	17	68%	2	4	4	7
7	16	64%	3	3	5	5
8	15	60%	1	3	4	7
9	16	64%	2	4	4	6
<b>Average</b>		<b>74%</b>	<b>2.22</b>	<b>4.33</b>	<b>4.67</b>	<b>7.22</b>
			<b>74%</b>	<b>72%</b>	<b>78%</b>	<b>72%</b>
<b>SD</b>			<b>0.63</b>	<b>0.94</b>	<b>0.82</b>	<b>1.13</b>

**Average Score per Question: Classes A and B**

	Qu.1	Qu.2	Qu.3	Qu.4
<b>Class A (2011)</b>	58%	60%	50%	55%
<b>Class B (2012)</b>	74%	72%	78%	72%
<b>Difference</b>	15.7%	11.8%	27.8%	17.2%

**Table C: Comparison of Class A and Class B's Examination Results**



The only known difference between the lesson content and teaching methodologies used in both classes were the TREs. This suggests that the 2012 version of the TREs with their differing number and location of breakpoints promote better outcomes.

## 8.2 Total Time Taken to Complete Each Exercise and the Time Taken to Coordinate Text Chunks

Regarding research question 2: the time taken for a pair of students from class A and B to complete the 'Swimwear' TRE was measured. The number of breakpoints in the 2011 class A version was 36, and in the 2012 class B version, 21. The class A pair took 15 minutes and 10 seconds to complete the 2011 version, and the class B pair took 11 minutes and 8 seconds to complete the 2012 version. This is a difference of 1 minute and 3 seconds between the two versions of the same TRE. The average time taken for the class A pair to look at a breakpoint, and select the next correct chunk of text was 44 seconds, and for the class B pair, it was 48 seconds. This is an average difference of 4 seconds per breakpoint.

For the 'Traffic accident, witnesses A and B', TRE, the class A (2011) pair took 14 minutes and 5 seconds, and the class B (2012) pair took 13 minutes and 2 seconds, which is a difference of 1 minute 3 seconds between the two versions. The number of breakpoints in the 2011 class A version was 19, and in the 2012 class B version, 16. The average time taken for

the class A pair to look at a breakpoint and select the next correct chunk of text was 26 seconds, and for the class B pair, it was 25 seconds - a difference of 1 second per breakpoint.

**Comparison of Times Taken to Complete TREs**

	Traffic Accident TRE Total Times	Time Taken per breakpoint	Swimwear TRE Total Times	Time Taken per breakpoint
<b>Class A (2011)</b>	14m 5s 0ms	0m 44s 474ms	15m 10s 0ms	0m 26s 765ms
<b>Class B (2012)</b>	13m 2s 0ms	0m 48s 875ms	11m 8s 0ms	0m 25s 692ms
<b>A-B difference</b>	1m 3s	-0m 4s 401ms	4m 2s	0m 1s 72ms

Of the two TREs measured, the 2012 versions with fewer breakpoints took less time to complete overall, and the time differences were measurable in minutes. Time difference between the *Swimwear* versions was 1 minute 3 seconds, and for the *Traffic Accident* versions 4 minutes 2 seconds. However, the difference in time taken selecting what they believed to be the next correct chunk of text, was 4 seconds for the ‘*Traffic accident, witnesses A and B*’ TRE, and 1 second for ‘*Swimwear*’. This suggests that reducing the number of breakpoints shortens the total time taken to complete an exercise, but it does not affect the amount of time taken by the participants when analyzing and deciding on which chunks of text match.

## 9. DISCUSSION

The data above shows that those students who used the 2012 version of the TREs outperformed those taking the 2011 version. However, whether this is due only to the reduced number of breakpoints, and/or the longer strings of text between those points, is not known.

Comparative analysis of the videos taken of the participants completing the 2011 and 2012 versions of the exercises, suggests that by breaking the text according to grammatical conventions focuses participants’ attention on grammar and structure. More discussion and use of metalanguage related to grammar was observed in the 2011 version than in the later version.

The 2012 version seemed to generate more complex dialogs with more focus on whether a string of text was part of a premise or a conclusion. This would seem to indicate that the location of breakpoints plays a pivotal role in the outcomes of these exercises. Although these observations are made from four small samples, and only a rough assessment of those dialogs, the results indicate that further, more detailed investigation is needed to confirm whether this is actually the case.

There is also the possibility that the placement of breakpoints before or after key punctuation marks also play a role. After all, the discovery that students in the 2011 versions of the TREs were using a period followed by a capital letter as the only criteria by which to make certain selections was one of the reasons for reassessing the TREs. Again, further investigation is required into what roles punctuation and collocation play in the learner's selection and decision-making process.

Finally, while this pilot study indicates that the later TREs resulted in improved performance on examination questions, it is unknown whether this knowledge becomes fully internalized, and transferable to real world critical analysis of argument or not. While success on the examination questions suggests learners have begun to distinguish between strong and weak arguments. It does not indicate whether or not they have picked up the ability to objectively analyze an argument without bias in the real world. Also, as Truscott (1998) points out, it is unknown at this point whether the noticing of these features will dissipate over time or become fully internalized. Perhaps, in order to complete the shift from the declarative knowledge stage to the procedural knowledge stage, further open-ended tasks will be required.

## **10. CONCLUSION**

In this study, the authors have reported on the implementation of redistributed breakpoints in TREs, and how these differed from the more traditional placement of breakpoints that were previously used. It was observed that the latter version of the TREs, whereby breakpoints in the text were placed before punctuation marks at full phrase and inter-sentence positions, led to improved performances on examination questions that were designed to test students' understanding of the structure of argument and the metalanguage associated with it.

In addition to the improved test performances observed, the reduction of breakpoints reduced the overall time taken by the participants in completing the exercises without significantly reducing the time spent analyzing and selecting the next suitable chunk of text. This suggests that these newer versions are also a more efficient use of time when compared with the older version.

The improved examination results, along with the improved efficiencies in time utilization, bode well for the use of TREs in the current context, however, further research will be required to confirm that these findings are replicable, and more importantly whether these skills are transferable and retainable.

### References

- Anderson, J. R. (1982) Acquisition of cognitive skill. *Psychological Review*, Vol 89(4), Jul 1982, 369-406.
- Brett, P. (1994) Using text reconstruction software. *ELT Journal*, 48 (4), 329-336.
- Brown, M. N. and Keeley, S. M. (2004). *Asking the Right Questions* 7<sup>th</sup> Edition, Pearson, Prentice Hall
- Cook, V. (2001). *Second language learning and language teaching*. New York, London: Hodder Arnold
- Dabaghi, A., Zabihi, R., & Rezazadeh, M. (2012). Argumentative and narrative written task performance: Differential effects of critical thinking. *International Journal of Research Studies in Language Learning*, 24 June 2012.
- Dick, R. D. (1991). An empirical taxonomy of critical thinking. *Journal of Instructional Psychology*, 18, 79-92.
- Dixon, F. A. (2001) The Memorable Link: Designing Critical Thinking Activities That Stimulate Synthesis and Evaluation Among Verbally Gifted Adolescents  
*Journal of Advanced Academics* November 2001 vol. 13 no. 2 73-84

- Gann, D. and Bufton, N. (2012). Critically Minded Podcast: A guide to producing, implementing and getting the most out of podcasting. *The Journal of Saitama City Educators*, 2 (5), 1-7.
- Egege, S. and Kutieleh, S. (2003) Critical Thinking: Teaching Foreign Notions to Foreign Students. *International Education Journal Vol 4, No 4, 2004 Educational Research Conference 2003 Special Issue* <http://iej.cjb.net>
- Ellis, N. C. (2008) in J. Cenoz and N. H. Hornberger (eds), *Encyclopedia of Language and Education, 2nd Edition*, Volume 6: Knowledge about Language, 1–13. © 2008 Springer Science+Business Media LLC.
- Ennis, R. H. (1993). Critical Thinking Assessment. *Theory Into Practice*. Summer.
- Faerch, C. and Kasper, G. 1983. *Strategies in Interlanguage Communication*. London, Longman.
- Fisher A. (2001) *Critical Thinking An Introduction* Cambridge University press.
- Greenlaw, S. A. & Deloach, S. B. (2003) Teaching Critical Thinking with Electronic Discussion. *The Journal of Economic Education*. Vol. 34, Issue 1 Routledge
- Hyland, K. 2006. *English for Academic Purposes: an advanced resource book*. London, New York. Routledge.
- Hashemi, R. & Zabihi, R. (2012). Does Critical Thinking Enhance EFL Receptive Skills? *Journal of Language Teaching and Research*, 3(1), 172-179.
- McCutcheon, L. E., Apperson, J. M., Hanson, E., & Wynn, V. (1992). Relationships among critical thinking skills, academic achievement, and misconceptions about psychology. *Psychological Reports*, 71, 635-639.
- Norton, B., & Toohey, K. (2004). *Critical pedagogies and language learning*. Cambridge:

Cambridge University Press.

Quinn, C. N. (1993). *Cognitive skills and computers: "Framing" the link*. Proceedings of the Fifth International Conference on Thinking, Townsville, Australia.

Rovai, A. P. (2002). Development of an instrument to measure classroom community. *Internet and Higher Education*, 5(3), 197 – 211.

Schmidt, R.W. (1990). The Role of Consciousness in Second Language Learning. *Applied Linguistics* 11(2), 129-158.

Schmidt, R.W. 1993a: Awareness and second language acquisition. *Annual Review of Applied Linguistics* 13, 206–26.

Stoney, S., & Oliver, R. (1999). Can higher order thinking and cognitive engagement be enhanced with multimedia? *Interactive Multimedia Electronic Journal of Computer Enhanced Learning* 2 [WWW document]. URL [http:// imej.wfu.edu](http://imej.wfu.edu)

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and Instruction*, 4, 295-312.

Thornbury, S. (1997). Reformulation and reconstruction: tasks that promote 'noticing'. *ELT Journal* 51 (4) 326-335.

Truscott, J. (1998) 'Noticing in second language acquisition: a critical review.' *Second Language Research* 14, 2 (1998); pp. 103~135

Tsui, L. (2002). Fostering critical thinking through effective pedagogy: Evidence from four institutional case studies. *The Journal of Higher Education*, 73(6), 740-763.

Twardy, C. (2004) Argument Maps Improve Critical Thinking. (computer-based argument mapping / Reason!Able software) *Teaching Philosophy*. Vol. 27, Issue 2, June 2004 p.p. 95-116

van Gelder, T. (2000) Reason!Able software <http://timvangelder.com/software/>

Vygotsky, L.S. (1978). *Mind in Society*. Cambridge, Massachusetts: Harvard University Press.

Yeh, Y. & Wu, J. (1992). The relationship between critical thinking and academic achievement among elementary and secondary school students. *Journal of Education and Psychology*, 15, 79-100.