Use of Syntactic Elaboration Techniques to Enhance Comprehensibility of EST Texts

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Abstract

The current study examined differential effects of two pre-modification types, syntactic elaboration and syntactic simplification (at the level of syntax and irrespective of problematic lexis), on EST students' reading comprehension. The purpose was to see whether a priori syntactic elaborative adjustment, given its advantages over simplification, can augment comprehensibility of scientific texts in order to replace simplification adjustment. To carry out the study, three versions of 5 passages including Baseline, syntactically simplified, and syntactically elaborated were provided. All the five passages were relevant to civil engineering and they were modified using two above-mentioned techniques. The subjects of the study were composed of 185 homogenous civil engineering students who participated in different phases. The results revealed that syntactic simplification and syntactic elaboration procedures operated nearly in the same way in orienting the EST texts toward comprehensibility. The results of the study even indicated that students benefited more from elaborated than simplified texts although it was not statistically significant. Therefore, the study supports the view that syntactic elaborative adjustment can be exercised in advance on EST materials for pedagogical purposes since it increases the reading comprehension at the same time keeps unfamiliar syntactic units intact to be learned by EST readers

Keywords: Elaboration, Simplification, EST Texts, Comprehensibility

Introduction

The significance of English as a medium of general communication across the nations is completely evident. But with the advancements in scientific, technical and economic activity in the world, its importance is growing more and more palpable as an international language. John and Evans (1991) announce that the demand for English for specific purposes (e.g., English for science and technology, English for business, vocational ESL) continues to expand over the world with the entrance of TESOL to its second quarter century.The only and most important skill required to access professional information in various subject fields is reading comprehension (Richards, 1976). Especially for students in an academic setting to make use of materials in different domains of science and technology, reading ability has been found to be the most required skill. Parallel to this, Beasley (1990) maintained that acquiring the ability to read academic texts is of paramount importance for the university students of English as a second language and as a foreign language. This awareness has been pointed out by such scholars as John and Duddley-Evans (1991), Jordan (1997) and Hudson (1991). John and Duddley-Evans state "In ESP practice the single skill is usually reading because of its primary importance in many EFL environments" (p.305). More often ESP students' success in their specific subject of study is bound to their ability to read sufficiently in English. And In the past decade, there has been sustained interest in promoting reading as a significant and viable means of language development for second and foreign language learners (Taguchi, Gorsuch and Takasyasu, 2004).

Regarding the primary significance of acquiring the reading ability by ESP/EST students for academic purposes, steps have been taken to identify the problematic factors underlying reading process. Researchers enthusiastic to pursue these steps have to first specify whether comprehension failure is due to linguistic complexity of original, authentic texts or something else.

Grabe (1991) argues that some knowledge areas that have bearing on the efficiency of reading process are structural and vocabulary knowledge. That is, readers with less command of such areas of knowledge will get into trouble processing written texts. Campbell (1987, p.132) made it clear that "linguistic difficulty would more affect the less advanced learners' enjoyment of texts and their development of fluent reading skills in the target language". Paran (1996) and Birch (2002) caution researchers and teachers against inordinate engagement with top-down process and highlight that L2 readers are to attend more to bottom-up strategies than L1 readers as their restricted linguistic ability will make it more difficult for them to use the contextual cues that L1 readers use.

The above-mentioned arguments illuminate that there exists a relationship between poor reading and linguistic complexity and pedagogical forces must join to eradicate or to at least alleviate reading-specific problems of EST students.

Statement of the Problem and Purpose of the Study

The importance of reading skill for ESP/EST students is incontrovertible regarding the increased number of written materials in English which are related to the major academic study of students. Additionally, it has become evident that the acquisition of this apparently straightforward skill is not that much easy and students' reading fluency is hampered by many linguistic problems. Some of the problems are attributable to the syntactic complexity of the reading materials and some stem from the students' bad command or exiguous knowledge of various types of vocabulary namely general, technical and sub-technical. The literature gives evidence to the fact that the relationship between the syntactic knowledge in English and the ability to read is too close to be taken for granted in English language pedagogy. Kelly (1995) states that sufficient control of syntactic knowledge contributes highly to the reading process such that students with greater syntactic competence have been observed to have an access to the lexical knowledge, on the other hand, knowledge of lexis has had impalpable influence on the contribution of syntactic knowledge to reading comprehension. Grabe and Stroller (2001) maintain " arguments that L2 readers do not need knowledge of grammar, occasionally voiced in the L2 literature, are clearly wrong" (p.43). Stott (2001) asserted that basic bottom-up processing must not be ignored and lexico-grammatical aspects, particularly in the early stages of EFL learning should be highlighted. Wallace (1992), also, believes that fully authentic texts are linguistically very complex for many students and she goes on to point out that simplified materials can be useful whether they are prepared by teachers, or published as textbooks.

The question posed here is whether treatment of the complex syntactic items of the original written texts in scientific areas can help less-proficient ESP/EST students cope with syntactically triggered reading comprehension problems.

Some of the procedures so far proposed for helping students with better comprehension of linguistic codes are: simplification (linguistic adjustment) and elaboration. In simplification process the problematic features of the authentic scientific texts are superseded by more simpler and comprehensible ones. In the process of elaboration, on the other hand, more explicative expressions are added to the text to compensate for unknown, complex linguistic items that induce reading comprehension problems. Although simplification may increase the comprehensibility of written input for nonnative readers this "serves only the immediate needs of communication, not the future interlanguage development of the learner"(Long, 1987, p.350). Some disadvantages have been mentioned for making use of simplification techniques in the treatment of written texts:

1) Use of short simple sentences may not be of efficacy for language learning, because even though learner may be able to read text pitched to his current linguistic competency this adjustment deprives learner from acquiring the items that eventually should be learned. (Yano etal., 1994) and Ragan (2006)

2) It distorts the authenticity of the text

3)This procedure induces the learner to develop reading strategies not appropriate for reading authentic, unsimplified versions. (Honeyfield, 1977)

Studies testify, under the findings, that elaborative procedures are as efficient as simplification procedures in improving comprehensibility of English texts. Yano et. al., (1994) found no statistically significant discrepancy between the scores of students reading simplified version and of those reading elaborated version.. Ragan (2006) believes that text elaboration might help to alleviate the difficulties less skilled readers have when relying on imprecise or incorrect background knowledge. Some advantages have been enumerated for the application of elaborative procedure in modifying the text :

1-It allows more native- like complexity and is at least equally successful in promoting comprehension. (Parker and Chaudron, 1987)

2- Texts with syntactic complexity are more advantageous to students' comprehension than ones with simpler syntax. (Blau's, 1982)

3-Preparing redundancy through exemplification, repetition, paraphrase, definition, and synonym elaborative alteration may provide students with the opportunities to process the information and thereby improve reading comprehension. (Oh's, 2001)

4- Elaborative modification in the form of repetition of information and clear segmenting of the thematic structure of the communication augments understanding.

5- Elaborative modification enhances comprehensibility of the authentic texts at the same time keep the new items

necessary for learning intact. (Oh's, 2001)

Given the above-mentioned drawbacks enumerated for the simplification process, and the advantages discovered and suggested on the side of elaborative alteration, the 'elaborative modification' as an alternative technique was proposed for modifying the English texts.

With the tension between the requirements of the comprehensible input for language acquisition and preservation of the authenticity of the text we may have to reconcile these two by using the technique of elaborative modification which would acquaint ESP/EST readers with authentic characteristics of the text and simultaneously equip them with the necessary skills for coping with complex items in authentic texts. If the application of this technique for the modification of problematic, complex syntactic items should prove efficacious in improving the comprehensibility of EST written texts, it can offer many implications for teachers and material designers of EST in academic contexts.

Research Questions

The questions posed for the current study are as follows:

1. Is there any significant difference between the performance of EST students on baseline version and syntactically simplified (linguistically adjusted at syntactical stage) version of reading comprehension texts?

2. Is there any significant difference between the performance of EST students on baseline version and syntactically elaborated version of the reading comprehension texts?

3. Is there any significant difference between the performance of EST students on linguistically adjusted version and syntactically elaborated version of the texts?

Design

The design for the present study is in the form of Ex Post Facto. The independent variable is the text type with three levels of *Baseline*, *Syntactically Simplified* and *Syntactically Elaborated* and the performance of students on these three text types constitutes dependent variable.

Procedure and Data Collection

At the outset, a pilot study was conducted to find some passages that nearly enjoyed the same linguistic complexity as the passages taken from the textbook. The tables 1 & 2 display the difficulty levels identified for both the sample passages extracted from the textbook and the passages taken from civil engineering material for the current study. The average readability and standard deviation for the random passages taken from the textbook were computed to be respectively 41.86 and 8.83. As table 2 shows the texts chosen for the study are nearly homogeneous i.e. they are in the same level of difficulty.

After the preparation of five texts they were administered to 32 civil engineering students at tertiary level in order to find syntactic units blocking the reading comprehension. The explored syntactic units pinpointed by the 32 civil engineering students were categorized and tabulated by the researcher for the ease of the study (see table 3).

Chi-Square test was run to select statistically frequent units for the modification and those syntactic units that had been underlined by 41 and higher than 41 percent of the participants were selected to be modified. 41 was the last score enjoying the X^2 value of 4.63 which really exceeded the critical value of 3.79 and thus was found to be statistically significant. Those underlined units that had the scores above 41% were also reasonably chosen for the modification as their X^2 values were higher than 4.63. Meanwhile, statistically less frequent units were discarded from the tables below and also remained intact during the modification process. The following table 3 displays the total complex syntactic units explored.

As the table 3 shows, totally 15 main syntactic units was found to be problematic during the reading of five separate texts. The explored syntactic units were modified once using the elaborative techniques and once using the techniques of simplification in order to examine the differential effects of these modification types on reading comprehension. In the elaborative course the researcher added redundancy and clearer signaling of thematic structure mainly in the form of "Paraphrasing", "Use of co-text", "recovery of reduced clauses (as a form of redundancy and signaling of thematic structure) " and "recovery or reconstruction of the elliptical structures (as a form of redundancy and signaling of thematic structure) ".

And within the process of simplification adjustment, the researcher applied such techniques as "use of two simple sentences rather than one complex sentence", "use of canonical word order (restoration of passive to active voice)", "deletion of sentence elements", "decreasing the number of S-nodes per T-unit".

To assess the comprehensibility of Baseline version of the texts and two newly designed versions, a test was developed and then was administered to 30 homogeneous students. Each item was analyzed for the characteristics of

(IF), (ID), (CD). Meanwhile, to examine its validity, the test was simultaneously administered with CELT test and the correlation of the two sets of scores was computed by "Pearson product moment correlation coefficient" and the reliability was calculated by the "Kudar-Richardson (KR-21)" formula.

The obtained correlation coefficient score for the two sets of scores was .78 which implies that the test is highly valid and the score for the reliability was found to be .66, showing that the test enjoys acceptable reliability index.

Analysis of the Data

Table 4 summarizes the descriptive data taken from the administration of three versions of reading comprehension texts on 93 subjects. As the table shows, the mean scores for the original, simplified and elaborated versions of texts were found to be respectively 12.18, 14.22,and 15.33. Additionally, minimum, maximum, and the standard deviation scores of each version of the texts are displayed in the table.

Descriptive statistics reveals that those students who read syntactically elaborated versions of the texts scored highest (M=15.33), which is followed by those who read syntactically simplified version of the texts (M=14.22). Students who read original version scored lowest (M=12.18).

In order to examine the statistical significance of differential effect of modification types One-way ANOVA was conducted. Result of One-way ANOVA is shown in table 5.

The results of ANOVA analysis displayed in table 5 demonstrates that there is a meaningful difference among the means obtained from the performance of three groups on different versions of the texts, $F(2,92)= 17.72$, $P< 0.005$, as the observed F ratio (17.72) exceeded the critical F with the 2/90 degrees of freedom and the p-value (Sig.) for the resulted F was .000 which is smaller than the established critical value .05.

Although result from ANOVA displays significant difference among the means, $p<0.005$, we still were not sure where this difference exists. As a result, a post hoc Scheffe test was carried out to make multiple comparisons. The result from the Scheffe test is displayed in table 6.

The results acquired in the post hoc shows the significance of the difference between the scores in three versions of the texts. The first comparison is between elaborated vs. simplified version, the second comparison is between elaborated vs. original and the third comparison is between simplified vs. original versions. As the result in this table reveals the first comparison is not significant statistically but the last two comparisons are significant statistically. Data analysis and result for each research question is discussed separately for each research question in the following part.

Hypothesis 1. *There is no significant difference between the performance of EST students on Baseline version and syntactically simplified (linguistically adjusted version at syntax level) version of the reading comprehension texts*

Post-hoc comparison (Sheffee) found original version group , M= 12.18, SD= 2.68 to display significantly less mean ratings than syntactically simplified version, M= 14.22, SD= 1.80, $F(2,92)= 17.72$, $P< 0.005$.

Therefore, the proposed null hypothesis is rejected safely and consequently, it can be concluded that there is a significant difference between the performance of the learners in these two versions of the passages.

Hypothesis 2. *There is no difference between the performance of EST students on Baseline version and syntactically elaborated version of the reading comprehension texts.*

The result proves that this difference is also significant statistically, $F(2,92)= 17.72$, $P< 0.005$. Given the p-value generated from the comparison of the two means from the performance of subjects on the two versions of Baseline and syntactically elaborated texts, the following hypothesis is also rejected. The observed p-value = .000 obtained from the comparison of means is significantly smaller than the critical value .05. As a result, it is concluded that students perform significantly better in elaborated version of the reading comprehension texts compared with the original version. It seems that elaborating passages syntactically has significant effect on the reading comprehension of the EST students.

Hypothesis 3.*There is no difference between the performance of EST students on syntactically simplified (linguistically adjusted at syntax level) version and syntactically elaborated version of the texts.*

The result of the descriptive statistics in table 4 indicates that there is there is a difference between the scores of the learners in the elaborated version, M=15.33, SD= 1.68 and simplified version, M= 14.22, SD= 1.80. It is clear that learners performed well in the elaborated version of texts than the simplified version of the texts, however; the difference between these two groups is not significant statistically as the observed P value, P= 0.130, is more than the established p vale, $P<0.05$.Therefore, the proposed null hypothesis cannot be rejected suggesting that the difference between the performance of the learners in the elaborated and simplified versions is not significant

statistically. That is, students reading syntactically elaborated texts did not perform significantly better than those reading syntactically simplified texts.

Discussion

Current study revealed that taking advantage of such major syntactic simplification techniques as "use of two simple sentences rather than one complex sentence", "use of canonical word order", "deletion of sentence elements", as well as "less number of S-nodes per T-unit" rendered EST texts with complex syntactic items more digestible and syntactic elaboration of elements in the form of "paraphrase" and "co-text" along with "reconstruction of reduced clauses and elliptical structures" provided enriched semantic context for clarification and configuration of syntactic-bound meaning, although the concomitant result of such operations were passages with more S-nodes per T-unit. The study even showed, albeit not statistically significant, the superiority of elaboration over simplification, at least at syntactic phase. Although in elaboration courses we come up with a lengthy text which requires more time than the simplified text to be processed by readers, the readers of the syntactically elaborated version performed better than those of the syntactically simplified texts within equal length of time dedicated to each. The explanation for this result may be that, at times, with pre-imposition of simplification procedures the text is more complexified than simplified in that through deletion and reduction of S-nodes some important concepts may be lost which in turn make the whole understanding more difficult to be achieved and further explanation for the current discovery may be that great length and complexity in any nature is not true indicator of the text difficulty but types of syntactic units constituting the text is of paramount importance in measuring the difficulty or comprehensibility of the text.

Given the simplification drawbacks explicated in previous sections , application of syntactic elaboration adjustment exercised in advance on EST texts may prove more advantageous as the use of such techniques augment the reading comprehension at the same time keep unfamiliar syntactic items intact to be learned by EST readers.

Implications of the Study

To make the passages digestible traditionally EST instructors and material designers set out deleting complex items or de-complexifying the linguistic structures using more familiar and frequent items. These are more characteristics of simplification process. By this the reader not only is denied the access to new and complex items that finally ought to be learned but also develops strategy of reading which works solely for adapted texts. The findings from this study, however, suggest further optimism by implying that there is an alternative material adjustment technique, syntactic elaborative modification, which can be adopted to pre-modify scientific texts without spoiling their authenticity.

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Table 1. Flesch Reading Ease for Sample texts extracted from textbooks

1	48.9	6	34.4
2	43.2	7	41.4
3	35.1	8	61.5
4	45.9	9	30.6
5	38.0	10	39.6

Table 2. Flesch Reading Ease for the texts used in the current study

1	Fundamental groups of construction materials	41.2
2	Load-soil deformation relationship	42.0
3	Air-entraining agents	41.2
4	Liquids	41.4
5	Artificial preservatives	42.0

Table 3. Total Complex Syntactic Units Percentage of Students

1	Prepositional Phrases	41
2	Pronominal expressions	45
3	Relative clauses	49
4	Prepositional phrases expressing logical relationships	51
5	Reduced clauses	53
6	Contracted compound sentences	53
7	Subordinate adverbial clauses of cause or reason	53
8	Adjective compounds	56
9	Noun phrases as subject complement	56
10	Adverbial clauses of condition	57
11	Abridged independent clauses	62
12	Conjunctive phrases	67
13	Passive Constructions	68
14	Adverbial clauses of concession	71
15	Adverbial clauses of comparison	75

Table 4. Descriptive Statistics for three text versions

	N	Minimum	Maximum	Mean	Std. Deviation
Original	32	6.00	16.00	12.1875	2.6813
Simplified	31	11.00	17.00	14.2258	1.8020
Elaborated	30	12.00	18.00	15.3333	1.6884
Valid N (listwise)	30				

Table 5. Result of one way-ANOVA analysis

	Sum of squarres	df	Mean square	F	Sig
Between Groups	158.738	2	79.369	17.727	.000
Within Groups	402.961	90	4.477		
Total	561.699	92			

Table 6. Result of Post Hoc Test

		Mean difference	Std.Error	Sig.	95% confidence internal	
					Lower Bound	Upper Bound
Elaborated	simplified	1.1075	.5419	.130	.2413	2.4564
	origional	3.1458*	.5377	.000	1.8074	4.4843
Simplified	elaborated	-1.1075	.5419	.130	-2.4564	.2413
	origional	2.0383*	.5332	.001	.7110	3.3656
Origional	elaborated	-3.1458*	.5377	.000	-4.4843	-1.8074
	simplified	-2.0383*	.5332	.001	-3.3656	.7110