

The Effect of Reducing Lexical and Syntactic Complexity of Texts on Reading Comprehension

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Abstract

The present study investigated the effect of different types of text simplification (i.e., reducing the lexical and syntactic complexity of texts) on reading comprehension of English as a Foreign Language learners (EFL). Sixty female intermediate EFL learners from three intact classes in Tabarestan Language Institute in Tehran participated in the study. The intact classes were assigned to three experimental groups. Moreover, to homogenize the groups, the researchers administered a general proficiency test (TOEFL, 2003) to the participants. The results revealed no significant difference among the groups in general proficiency and reading ability. Then four reading comprehension texts from TOEFL test (2005) were simplified through lexical simplification, syntactic simplification or lexical-syntactic simplification techniques. The simplified texts, along with their reading comprehension (RC) questions, formed the three versions of the post-test, each version contained either lexically, syntactically or lexical-syntactically simplified texts. Each group took one version of the post-test. The scores were analyzed through one-way ANOVA. The results revealed a significant difference among the groups. The post hoc test indicated that the lexical-syntactic simplification group significantly outperformed the lexical simplification group and performed considerably better than the syntactic simplification group. There was no significant difference between the lexical and syntactic simplification groups, although the latter showed better results.

Keywords: lexical simplification, syntactic simplification, lexical-syntactic simplification, reading comprehension

Language input has always been an essential issue in second language learning. It is a necessary condition for language learning; learners need to be exposed to some forms of linguistic data to acquire a target language. Gass and Alvarez Torres (2005, p.2) considered it as "sine qua non of acquisition," and Ellis (2008) asserted that "all theories of L2 acquisition acknowledge a role for input" (p.205). However, it is commonly acknowledged that the input must be comprehensible for the learner to assist the process of language acquisition.

In formal language education, the input is mainly presented as texts that learners are asked to read in the classroom or at home. Some experts prefer authentic texts, texts that are written for native speakers for purposes other than language instruction. They argue that authentic texts arouse learners' interest and motivation more and expose them to real language. But most language teachers and materials developers believe that authentic texts are demanding for learners, especially those at lower levels, as they contain more complex structures and vocabulary than learners can process (McLaughlin, 1987; Sonmez, 2007). Hence, most language teaching scholars and practitioners maintain that language input must be modified in some way to be comprehensible for the learner. Proponents of text modification argue that altered texts provide more comprehensible input as they have less sophisticated linguistic features (more common words, simpler structures and more repetition and cohesion).

Among the different ways of achieving comprehensible input, the use of text simplification has been the most common practice in second language education. Text simplification is the process of reducing the syntactic and lexical complexity of a text while trying to preserve the original information and meaning of the text (Siddharthan, 2014). It includes the use of shorter sentences, simpler syntax, simpler vocabulary and canonical word order. Authentic texts are usually simplified before they are exposed to language learners. Research on second language textbook reading materials has shown that most textbook passages have

been linguistically simplified (Hague & Scott, 1994; Tomlinson & Masuhara, 2013; Young, 1999).

Language teachers and scholars who have been involved in the development of EFL materials realize that authentic texts are not suitable for most TEFL contexts and they agree with Widdowson (1984), who asserted "pedagogic presentation of language necessarily involves methodological contrivance" (p.218). Saggion (2017) pointed out that language learners "may have a very restricted lexicon and may not be able to understand certain grammatical constructions" (p.4). The majority of studies on the effect of text simplification have revealed a significantly positive impact of text simplification on learners' comprehension (Anani Sarab & Karimi, 2008; Blaue, 1982; Brown, 1987; Crossley & McNamara, 2016; Gardner & Hansen, 2007; Heydari, Khodabandehlou & Jahandar, 2013; Klare, 1974; Long & Ross, 1993; Moradian, Naserpoor & Tamri, 2013; Oh, 2001; Tweissi, 1998; Yano, Long & Ross, 1994), although there have been some counterarguments (Bernhardt, 1984; Leow, 1993; Parker & Chaudron, 1987; Swaffar, 1985).

However, despite the abundance of research on the effect of text simplification, there has been a lack of studies comparing the effects of different types of text simplification (lexical, syntactic, etc.). Only a few studies have examined the effects of different kinds of simplification on learners' comprehension, and the findings have been inconclusive. Keshavarz et al. (2007) found no significant difference in the effects of different types of linguistic simplification, but in Tweissi's (1998) study, lexical simplification was significantly more effective than lexical-syntactic simplification.

The present study attempted to compare the effects of lexical, syntactic, and lexical-syntactic simplifications on reading comprehension of Iranian intermediate EFL learners to fill this gap and shed more light on the issue. To that end, the following research questions were put forth and investigated through empirical research.

1. Is there any significant difference in the effects of the different types of text simplification on Iranian intermediate EFL learners' reading comprehension?
2. Is there any significant difference in the effects of lexical simplification and syntactic simplification on Iranian intermediate EFL learners' reading comprehension?
3. Is there any significant difference in the effects of lexical simplification and lexical-syntactic simplification on Iranian intermediate EFL learners' reading comprehension?
4. Is there any significant difference in the effects of syntactic simplification and lexical-syntactic simplification on Iranian intermediate EFL learners' reading comprehension?

Literature Review

The controversy over the use of authentic versus contrived texts has long been one of the major issues in language teaching in general and in materials development in particular. Some experts argue that simplification and contrivance can facilitate learning, whereas the other group maintains that they can result in faulty learning and deprive the learners of informal learning (Tomlinson, 2013). Proponents of simplified texts argue that authentic texts, most of the time, do not provide the learner with comprehensible input, as they contain plenty of complex language structures and unknown new vocabulary. Day and Bamford (1998, as cited in Tomlinson, 2013, p.6) criticized the "cult of authenticity" and advocated simplified reading texts which have the "natural properties of authenticity". Moreover, some researchers have redefined 'authenticity' about 'the learners' interaction with a text' or 'the personal engagement of the learner' (Widdowson, 1978; van Lier, 1996; both cited in Tomlinson, 2013). Davies and Widdowson (1978, as cited in Crossley, Allen & McNamara, 2012) considered simplified texts as valuable aids to language learning as they truly reflect what second

language readers already know about the target language and can expand this knowledge.

Text simplification aims to provide the reader with a text that is more accessible and more comprehensible (Crossley, Allen, McNamara, 2011). Simplified texts are either adapted from authentic texts or written explicitly for the second language reader. They contain less sophisticated vocabulary, less syntactic complexity and greater cohesion (Crossley et al., 2011). McDonough, Shaw, and Masuhara (2013, p.75) pointed out that text simplification can be done according to:

1. Sentence structure. Sentence length is reduced, or a complex sentence is rewritten as some simpler ones, for example, by the replacement of relative pronouns by nouns and pronouns followed by the main verb.
2. Lexical content, so that the number of new vocabulary items is controlled by reference to what students have already learned.
3. Grammatical structures. For instance, passives are converted to actives; simple past tense to simple present; reported in direct speech.

Research on the effect of text simplification on reading comprehension of aphasic people has revealed a positive impact for simplification; i.e., text simplification increased aphasic people's reading comprehension and recall. Rello, Baeza-Yates, Dempere, and Saggion (2013) did an experiment to study whether lexical simplification can benefit people with dyslexia (a difficulty with reading and writing due to the brain's being unable to see the difference between some letter shapes). They found that using more frequent words helped the participants with dyslexia to read significantly faster, while the use of shorter words helped them to understand the text better. Shewan and Canter (1971) examined the effects of syntactic complexity, vocabulary and sentence length on auditory comprehension of people with aphasia. The study indicated that syntactic complexity provided the most difficulty for aphasics.

Studies on the effect of text simplification on reading comprehension of second language readers have provided mixed results. Some studies have refused any positive impact of text simplification on learners' reading comprehension (Bernhardt, 1984; Ghane, Oroji & Habibzadeh, 2015; Lewo, 1993; Parker & Chaudron, 1987; Swaffar, 1985; Ulijn & Strother, 1990). Parker and Chaudron (1987) revealed that linguistic simplification (simplified syntax and vocabulary) did not have a significantly positive effect on comprehension of the information. Ulijn and Strother (1990, p.38), investigating the effect of syntactic simplification on reading comprehension, found "no significant differences between subgroups reading an authentic (in original, not in adapted form) computer science text and those reading a syntactically adapted text either in comprehension or in time." However, despite the trend favoring authentic texts for all proficiency levels, the majority of texts in second language textbooks are simplified passages; most scholars and practitioners in language teaching and materials development appreciate the value of simplified texts, especially those for beginner and intermediate levels (Johnson, 1982; Shook, 1997; Young, 1999).

Moreover, the majority of studies regarding the effect of text simplification on learners' reading comprehension have reported a significantly positive effect of text simplification (Anani Sarab & Karimi, 2008; Blaue, 1981; Brown, 1987; Crossley & McNamara, 2016; Gardner & Hansen, 2007; Heydari et al., 2013; Johnson, 1981; Klare, 1974; Long & Ross, 1993; Lucas, 1991; Moradian et al., 2013; Oh, 2001; Tweissi, 1998; Yano et al., 1994). Crossley and McNamara (2016) compared second language readers' comprehension of authentic and simplified texts and revealed that "simplified texts lead to greater comprehension gains" (p.14). Long and Ross (1994) and Yano et al. (1994) compared the reading comprehension scores of EFL learners using three versions of the same text (authentic, simplified, and elaborated versions). They found that the students who read the linguistically simplified texts scored significantly higher than those who read the authentic texts while there

was no significant difference between the students who read the authentic texts and those who read elaborated texts.

Anani Sarab and Karimi (2008) investigated text modification in three conditions (using unmodified, linguistically simplified and interactionally modified texts) and found that both linguistic simplification and interactional change had significantly positive effects on the reading comprehension of Iranian EFL learners.

Despite the vast number of studies evaluating text simplification, there has been a lack of research on the effects of different types of simplification (i.e., syntactic, lexical, syntactic-lexical simplifications) on second language readers' comprehension. There have been only a few studies comparing the effects of different types of linguistic simplification, and the findings have been mixed and inconclusive. Tweissi (1998) investigated the effect of different types of text simplification on reading comprehension of 200 Omani EFL learners and found that each type of text simplification (lexical, syntactic, lexical-syntactic simplifications) was significantly more effective than using authentic texts. However, lexical simplification led to a greater gain in reading comprehension than other types of text simplification. There was no significant difference in the effects of syntactic and lexical simplifications, but lexical simplification was significantly more effective than full (lexical-syntactic) simplification.

Keshavarz et al. (2007) investigated the effects of topic familiarity and different types of linguistic simplification (lexical, syntactic and lexical-syntactic simplifications) on Iranian EFL learners' reading comprehension. They found that topic familiarity had a significant effect on the learners' comprehension but text simplification, in general, did not have such an effect. Furthermore, the study revealed that there was no significant difference among different types of text simplification (lexical, syntactic and lexical-syntactic simplifications).

The present study tries to compare the effects of lexical, syntactic, and lexical-syntactic simplifications on reading comprehension of Iranian

intermediate EFL learners and provide some contribution to resolve the issue.

Method

Participants

The participants of the study were 60 female intermediate EFL learners, with an age range of 18 to 28, learning English at Tabarestan Language Institute in Tehran, Iran. They were chosen from 67 intermediate EFL learners in three intact classes available at the institute through a general proficiency test (TOEFL 2003). The students who scored two standard deviations above and below the mean were selected. The intact classes were randomly assigned to the three experimental groups (lexical simplification, syntactic simplification, and lexical-syntactic simplification groups). According to the institute's placement procedures, the three classes were considered to be at the intermediate level and identical concerning general proficiency, but a TOEFL test (2003) was used to ensure further that the participants in the three experimental groups were homogeneous regarding general proficiency and reading ability.

Instruments

The instruments used in the present study included a general proficiency test (TOEFL, 2003) and a reading comprehension post-test in three versions.

General proficiency test. To ensure homogeneity of the participants on the onset of the study, a general proficiency test (TOEFL, 2003) was administered to the participants of the three experimental groups. The test consisted of Structure and Written Expressions and Reading Comprehension sections, each section containing 30 multiple choice items. Since the test was a true TOEFL test, the validity and reliability of the test were already established, but as it was truncated, a Cronbach Alpha analysis was run on the test scores to ensure that the test reliability

was not distorted. The analysis revealed a relatively high-reliability index ($r = .71$) for the proficiency test. Finally, the results of Shapiro-Wilks test of normality ($SW = .981$, $df = 60$, $p = .464$) approved of the normality of the general proficiency test.

Post-test. To measure the effect of different types of text simplification on the reading comprehension of the participants, a reading post-test in three versions was used. Four reading comprehension texts from TOEFL (2005) were simplified using three types of linguistic simplification: lexical, syntactic and lexical-syntactic simplifications. The four simplified texts along with their 40 reading comprehension questions constituted the three versions of the post-test. The three versions included the same four reading comprehension passages and the same 40 reading comprehension questions, but their passages were simplified differently (through lexical, syntactic or lexical-syntactic simplifications).

The theoretical framework of the present study was based on text simplification models proposed by McDonough, Shaw, and Masuhara (2013) and Siddharthan (2004, 2014). Siddharthan (2004) defines text simplification as "any process that reduces the syntactic or lexical complexity of a text while attempting to preserve its meaning and information content" (p.17). In the present study, complicated words and complex structures in the reading texts were simplified as described below.

In lexical simplification, different words of the texts were replaced with more common and simple words. The content words of the texts which seemed to be difficult for intermediate EFL learners were checked in Longman Communication 3000 list and Cambridge English Vocabulary Profile to figure out difficult and infrequent words. Then Longman Contemporary Dictionary (5th edition) and Oxford Thesaurus (1994) were consulted to find more common and more accessible synonyms for the difficult words. Also, challenging idioms, phrasal verbs, and expressions were identified and replaced with simpler ones or

rewritten in ordinary non-idiomatic language. And semantically ambiguous phrases were rewritten in clear, unambiguous expressions. For instance, *onset*, *preceding* and *pioneering* were replaced by *start*, *last* and *early* respectively. The expression ‘*various rock units could be dated by their relative ages*’ was rewritten as ‘*the relative age of different rock units could be discovered*’.

In syntactic simplification, the complex structures were replaced by less complex ones; for instance, the passive sentences were changed to active ones, and the complex sentences containing subordinate clauses (relative clauses, adverb clauses or embedded noun clauses) were rewritten in two more straightforward sentences. Relative pronouns were replaced by nouns and pronouns and followed by finite verbs. Complex sentences including challenging adverb clauses were rewritten in two simpler sentences connected by appropriate conjunctions. Adverb or adjective phrases were changed to clauses or rewritten as separate sentences. For example, the sentence ‘*Specific rock types were thus assumed to have formed at characteristically different times, the softest rocks having formed the most recently*’ was rewritten in two sentences: ‘*Thus they assumed that specific rock types had formed at characteristically different times. And the softest rocks had formed the most recently*’. In lexical-syntactic simplification, both lexical and syntactic simplification techniques were employed. The original and differently simplified forms of a part of the post-test are presented in the Appendix.

Two native speakers of English and two PhD holders of Applied Linguistics reviewed the simplified texts and approved of the naturalness of the texts. The Cronbach Alpha analysis of the post-test scores reported acceptable reliability indexes for the three versions of the post-test: syntactically simplified test ($r = .74$), lexically simplified test ($r = .71$) and lexical-syntactically simplified test ($r = .78$). Finally, the normality of the post-test versions was examined by Shapiro-Wilks test of normality. The results (Table 1) revealed that the tests were regular and the data were

normally distributed. The p -value for all the test versions was above the critical p -value, which approved of their test normality.

Table 1.

Results of Shapiro-Wilks Normality Test on Post-test Scores

Post-test versions	Statistic	df	Sig.
Lexical simplification	.958	20	.508
Syntactic simplification	.972	20	.797
Lexical-syntactic	.953	20	.414

Data Collection Procedure

Initially, the researchers administered a general proficiency test (TOEFL, 2003) to the 67 intermediate EFL students of the three intact classes in the institute. The participants who scored two standard deviations above and below the mean were selected for the study. There were four outliers. To have an equal number of participants in each group, 20 students were chosen in each intact class. The analysis of the TOEFL test results indicated that the participants in the three intact classes were homogenous regarding general proficiency and reading ability. Each class, containing 20 participants, was randomly assigned to one experimental group. Then four reading comprehension texts were taken from TOEFL (2005) and were simplified through three different simplification techniques: lexical, syntactic, or lexical-syntactic simplifications. The simplified texts, along with their reading comprehension questions, constituted the three versions of the post-test. Each experimental group took one version of the post-test, and their scores were analyzed through some statistical techniques to answer the research questions of the study.

Data Analysis

The test scores of the participants on the general proficiency test (TOEFL, 2003) and its Reading Comprehension section were analyzed through a one-way ANOVA to ensure homogeneity of the participants

regarding general proficiency and reading ability respectively. Then the scores of the participants on the post-test were analyzed through a one-way ANOVA and a post hoc test (Scheffe test) to provide answers to the four research questions.

Results and Discussion

The results of the one-way ANOVA analysis comparing the performance of the participants on the general proficiency test (Table 2) revealed that there was no significant difference among the experimental groups regarding general proficiency ($F [2, 57] = .139, p = .871$). The p -value was considerably higher than the critical p -value ($p = .05$), which was evidence to the fact that the differences among the groups were not statistically significant. Furthermore, the performance of the participants on the Reading Section of the general proficiency test (TOEFL, 2003) was compared through a one-way ANOVA, and the results ($F [2, 57] = .183, p = .833$) indicated that there was no significant difference among the groups in terms of reading ability. Thus, the groups were shown to be identical in general proficiency and reading ability on the onset of the study, and there was no statistically significant difference among them. □

Table 2.

Results of ANOVA Analysis of the General Proficiency Test

	Sum of squares	df	F	Sig.
Between Groups	20.83	2	.139	.871
Within Groups	4318.90	57		
Total	4339.73	59		

Then the scores of the participants on the post-tests were compared to provide answers to the research questions. Table 3 presents the descriptive statistics of the post-test results. As the table indicates, the performances of the groups were different on the post-test. The participants in the lexical-syntactic simplification group had the highest mean score, and the syntactic simplification group ranked the second.

Table 3.

Descriptive Statistics of the Post-test Results

Groups	N	Mean	Std. Deviation
Lexical simplification	20	26.55	4.74
Syntactic simplification	20	29.55	4.90
Lexical-syntactic	20	32.65	3.70
Total	60	29.58	5.06

However, a one-way ANOVA analysis was required to indicate whether the difference among the groups was statistically significant or not. The results of the ANOVA analysis of the post-test results (Table 4) revealed that the difference among the three experimental groups was significant. The p -value (.000) was significantly below the critical p -value. Therefore, the first null hypothesis (There is no significant difference in the effects of the different types of text simplification on Iranian intermediate EFL learners' reading comprehension) was rejected.

Table 4.

Results of ANOVA Analysis of the Post-test Scores

	Sum of squares	df	F	Sig.
Between Groups	372.13	2	9.26	.000
Within Groups	1144.45	57		
Total	1516.58	59		

Subsequently, to determine which differences were statistically significant, a post hoc Scheffe test was carried out on the post-test scores (Table 5). As it is shown, the mean difference between the lexical simplification and syntactic simplification groups (3.00) was not considerably great, and there was no statistically significant difference between the post-test performances of the two groups ($p = .116$). Therefore the second null hypothesis (There is no significant difference in the effects of lexical simplification and syntactic simplification on Iranian intermediate EFL learners' reading comprehension) was

confirmed. The results indicated that lexical and syntactic simplifications have similar effects on EFL learners' reading comprehension. However, the mean difference between the lexical simplification group and the lexical-syntactic simplification group (6.10) was statistically significant. The p -value (.000) was considerably below the critical p -value, which revealed that lexical and syntactic simplifications together had a significantly higher effect on the EFL learners' reading comprehension than lexical simplification alone. So, the third null hypothesis (There is no significant difference in the effects of lexical simplification and lexical-syntactic simplification on Iranian intermediate EFL learners' reading comprehension) was rejected. Finally, the mean difference between the syntactic simplification and lexical-syntactic simplification groups (3.10) was not so high, and there was no statistically significant difference between the two groups ($p = .100$). The last null hypothesis (There is no significant difference in the effects of syntactic simplification and lexical-syntactic simplification on Iranian intermediate EFL learners' reading comprehension) was confirmed. It was shown that although lexical and syntactic simplifications together had a considerably greater effect on the learners' reading comprehension than syntactic simplification alone, there was no significant difference between them.

Table 5.

Results of Post hoc (Scheffe) Test on Post-test Scores

Groups	(I)	(J)	Mean Difference (I-J)	Sig.
	L	S	3.00	.116
	L	LS	6.10	.000
	S	LS	3.10	.100

L = Lexical simplification; S = Syntactic simplification; LS = lexical-syntactic simplification

The present study indicated that the more simplified a reading text is, the more comprehensible it will be for EFL learners. The lexical-syntactic simplification was shown to be the most effective linguistic

simplification in the study. It was significantly more effective than lexical simplification and considerably, although not significantly, more efficient than syntactic simplification. This finding is logically justifiable since when both syntactic and lexical complexities of a text are reduced, the second language reader will have less trouble comprehending the text. However, this finding was not in line with some previous research findings. In the study by Keshavarz et al. (2007), lexical-syntactic simplification was not significantly more effective than other types of simplification; it was even less useful than lexical simplification. In Twessi's (1998) study, lexical-syntactic simplification was substantially less effective than lexical simplification and considerably less productive than syntactic simplification. Unlike these studies, the present study indicated that lexical-syntactic simplification was more effective than lexical simplification and syntactic simplification on reading comprehension of language learners.

The study results also showed that although syntactic simplification was more effective than lexical simplification, there was no statistically significant difference in the effects of these types of simplifications on EFL learners' reading comprehension. This finding confirms the results of the studies by Tweissi (1998) and Keshavarz et al. (2007). In both studies, there was no significant difference between the performances of those who took the test with lexically simplified texts and the participants who took the test with syntactically simplified texts. However, in both studies, lexical simplification was more effective, although not significantly, than syntactic simplification. But the finding of the present study contradicted the results of the study by Arya, Hiebert, and Pearson (2001), which indicated that lexical complexity had a significant impact on American native speaker students' comprehension of science texts while syntactic complexity did not have such an effect.

Finally, the present research indicated that there was no significant difference in the effects of syntactic simplification and lexical-syntactic simplification on Iranian intermediate EFL learners' reading

comprehension. This finding is in line with the results of the studies by Tweissi (1998) and Keshavarz et al. (2007). Thus, some of the findings of the present study were in line with the findings of previous studies, and some were in contrast to previous findings. Further research is required to fill the research gap in this area and shed more light on the issue.

Conclusion and Implications

The present study investigated the effects of different types of text simplification on intermediate EFL learners' reading comprehension and revealed that lexical-syntactic simplification was the most effective. It was significantly more effective than lexical simplification and remarkably more efficient than syntactic simplification. The findings indicate that full (lexical-syntactic) simplification will benefit intermediate EFL readers the most. The less complex a text is both lexically and syntactically, the more comprehensible it will be for the learners. Both lexical and syntactic complexity may hinder reading comprehension of EFL readers, so assigned reading texts must not include too much lexical and syntactic complexity. However, there was no significant difference between lexical and syntactic simplifications, although the latter was more efficient. Thus, the findings suggest that language teachers and materials developers should involve both lexical and syntactic simplifications in preparation of materials for EFL learners, especially those at intermediate and lower levels. Moreover, the findings suggest that syntactic simplification must be paid more attention than lexical simplification, as syntactic simplification was shown to be more efficient.

The findings of the present study can be useful for language teachers, materials developers, and researchers. Language teachers and scholars who have been involved in developing materials for language learners, especially those at lower and intermediate levels, are most probably well aware of the need for text simplification. They realize that authentic texts usually contain much more linguistic complexity than

EFL learners can process. But they must be informed of the effects of different types of simplification on learners' comprehension. The present study revealed that lexical and syntactic simplifications together will have a greater effect on learners' comprehension and will provide more comprehensible input. Therefore, EFL materials developers are suggested to include both lexical and syntactic simplifications in their text preparation and materials development. Materials need to be at an appropriate level for EFL learners both in lexical and syntactic complexity. If a text is syntactically simplified but lexically unmodified or vices a versa, the text will still be difficult for learners to process. Both lexical and structure complexity hinders a learners' interaction with and comprehension of a text. Thus, logically a text must be at an appropriate level concerning both lexical and syntactic complexity to provide comprehensible input for the EFL learner. Moreover, if a text is only either syntactically or lexically simplified, the text will be unnatural and will provide an erroneous source for language acquisition. Lexical and syntactic features of natural, authentic texts are normally at the same level of complexity.

The second finding of the present study was that syntactic simplification might be more effective than lexical simplification. Therefore, materials developers are suggested to pay more attention to the syntactic complexity of reading texts and reduce grammatical complexity more attentively. The findings of the present study can also be useful for language teachers who develop their materials. Second language teachers can take the findings of the study into consideration when preparing materials for their students. Texts which are both lexically and syntactically at an appropriate complexity level will provide more comprehensible input for the learners. Therefore, teachers should adopt materials which are lexically and syntactically in a proper complexity level. Language teachers can also find interesting, authentic texts and simplify them to make them appropriate for their students. They can use the findings of the study in simplifying materials for their

students. Finally, language instruction researchers can benefit from the findings of this study and use them in their research programs. They can replicate the study or investigate topics not covered in the study. □

Like most studies, the present study could not cover all the related issues and had some limitations. So, further research is required to make for the limitations of the present study and investigate other aspects of text simplification. First of all, as there is a paucity of research on the effects of different types of text simplification (lexical, syntactic, etc.) on EFL learners' reading comprehension and the research results have been inconclusive, further research is required to replicate the study to confirm, or maybe challenge, the findings of this study. Moreover, the participants of the study were female students in 18-28 age range; therefore, interested researchers can investigate the effect of different types of text simplification on reading comprehension of male students and EFL learners in other age ranges.

The present study was limited to intermediate EFL learners so that further research can investigate the effect of different types of text simplification on other proficiency levels, like beginners and advanced EFL learners. The participants of the study were limited to language institute EFL learners; further studies can investigate the effects of simplifications on learners in other contexts like high school or university. Interested researchers can also probe the effect of text simplification on other language skills. Simplified texts might enhance EFL learners' listening comprehension, and different types of simplification may influence learners' listening comprehension in different ways. Further research is required to investigate the effect of text simplification in general and different types of text simplification on listening comprehension of EFL learners.

Finally, the present study investigated the effects of linguistic simplifications on reading comprehension; further research can explore the effects of other types of modification such as content simplification, text summarization, glossing and paraphrasing on EFL learners' reading or listening comprehension or acquisition of grammar and vocabulary. □

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Appendix

Sample texts from reading comprehension post-test in original and differently simplified forms (adopted from TOEFL 2005)

Unsimplified original text

At the turn of the twentieth century, Americans who wished to travel between cities either for work or for pleasure had limited options. The steam railroad offered the best, the most reliable and the fastest means of transport. Electric railways (trams and trolleys) provided reasonable intraurban and short-distance intercity travel. They also offered some longer routes, but only in certain parts of the country. Horse-drawn coaches were neither a competitive nor a comfortable alternative given the deplorable state of the nation's highways; and though bicycles were popular in both town and country, they, too, were hampered by poor road surfaces. It took the mass production and ownership of cars, together with increased attention to road construction, to bring the breakthrough in travel in the 1920s. And alongside the rapid spread of the popular and individualistic auto came the slower, but significant, growth of bus transport. Not only did buses largely replace trams and trolleys in urban mass transit, but they also opened up new avenues of intercity travel both to those Americans who could not afford cars and to those car owners who preferred to leave distance driving to others. □

Lexically simplified text

At the beginning of the twentieth century, Americans who wished to travel between cities either for work or for fun had few choices. The steam railroad offered the best, the most reliable and the fastest way of transportation. Electric railways (trams and trolleybuses) provided good inside city trips and traveled between neighboring cities. They also offered some longer roads, but only in certain parts of the country. Buses pulled by horses were neither a competitive nor a comfortable choice considering the rough roads of the country's highways; and although

bicycles were widespread in both town and country, they, too, were hampered by lousy road surfaces. It needed the production of cars in large numbers and ownership of cars, together with more attention to road building, to bring the main advance in travel in the 1920s. And beside the fast spread of the famous and personal cars came the slower, but important, growth of bus transport. Not only did buses mainly replace trams and trolleys in transportation of people in large numbers in cities, but they also opened up new ways of travel between cities both to those Americans who could not buy cars and to those car owners who preferred to leave far away driving to others. □

Syntactically simplified text □

At the turn of the twentieth century, Americans who wished to travel between cities for work or pleasure had limited options. The steam railroad offered the best, the most reliable and the fastest means of transport. Electric railways (trams and trolleys) provided reasonable intraurban and short-distance intercity travel. They also offered some longer routes in certain parts of the country. Given the deplorable slate of the nation's highways, coaches that were drawn by horses were not a competitive or a comfortable alternative. Bicycles were popular in both town and country. However, poor road surfaces hampered them too. Bringing the breakthrough in travel in the 1920s took the mass production and ownership of cars and increased attention to road construction. The growth of bus transport came alongside the rapid spread of the popular and individualistic auto. The growth of bus transport was slower but significant. Buses largely replaced trams and trolleys in urban mass transit. They also opened up new avenues of intercity travel to passengers. The passengers were those Americans who could not afford cars and those car owners who preferred to leave distance driving to others.

Lexical-syntactically simplified text:

At the beginning of the twentieth century, Americans who wished to travel between cities for work or for fun had few choices. The steam railroad offered the best, the most reliable and the fastest way of transportation. Electric railways (trams and trolleybuses) provided good inside city trips and traveled between near cities. They also offered some longer roads, but only in certain parts of the country. Considering the rough roads of the country's highways, busses that were pulled by horses were not a competitive or a comfortable choice. Bicycles were popular in both town and country. However, poor road surfaces hampered difficult too. Bringing the main advance in travel in the 1920s needed the production of cars in large numbers and ownership of cars and more attention to road building. The growth of bus transport came beside the fast spread of the popular and personal cars. The growth of bus transport was slower but important. Buses mainly replaced trams and trolleys in transportation of people in large numbers in cities. They also opened up new ways of travel between cities to passengers. The passengers were Americans who could not buy cars and those car owners who preferred to leave faraway driving to others.