

On the Notion of Psychological Reality of Immediate Constituent Structure and Its Implications in Reading Comprehension for Iranian EFL Students

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ABSTRACT

This study is an attempt to investigate the effect of physical arrangement of sentences on the basis of constituent structures of text type passages on Iranian EFL students' reading comprehension with regard to language proficiency. For this purpose, three English text type passages each consisting of six passages in one of three forms (a) texts with breaks at major constituent boundaries -Between constituents- (b) texts with breaks at minor constituent boundaries -within constituents- and (c) intact texts; were given to 90 students, who were divided into three groups at the same level of proficiency. A 30-item multiple-choice test was used to assess comprehension. To test the hypotheses posed in the study, the collected data were analyzed by ANOVA (one way) and scheffe test was utilized in post hoc analyses. The results of the study indicated that physical arrangement of sentences has a significant effect on students reading comprehension. So, what this research suggests is that constituents play an important role in students sentence perception and that EFL enterprise can enhance students' information- processing and perception by techniques of constituency-awareness on the part of EFL students.

Keywords: Reading, Reading comprehension, Psycholinguistics, Psychological reality, Constituents

1.0 INTRODUCTION

As stated by Celce-Murcia and Olshtain(2000), even in this modern age of multimedia and high-tech environments, it is still the case that most of us rely on our reading ability in order to gain information or expand our knowledge. Whether it is the sports fan who rushes to sports page of the newspaper, the investor who checks the financial page, or the tennis instructor who needs to know the weather forecast, information is available to all of them in print and it has to be processed via reading. They added, in a second or foreign language, reading carries even greater importance than in the first language since it is often the only readily available exposure to the target language. So in many second or foreign language teaching situations, reading receives a special focus. There are a number of reasons for this. First, many foreign language students often have reading as one of their most important goals. They want to be able to read for information and pleasure, for their career, and for study purpose. In fact, in most EFL situations, the ability to read in a foreign language is all that students ever want to acquire. Second, written texts serve various pedagogical purposes. Good reading texts also provide models for writing, and provide opportunities to introduce new topics, to stimulate discussion, and to study language e.g., vocabulary, grammar, and idioms. Reading, then, as noted by Richards and Renandya (2002) is a skill which is highly valued by students and teachers alike. But

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what is reading instruction like in the classroom? How do we teach reading? Do teachers teach according to principles derived from research findings?

Successful readers interact actively with the text –adding, deleting, and substituting words where appropriate. They use the cues available to seek the most direct path to meaning, drawing on prior conceptual and linguistic competence to predict what might plausibly come next. A number of authors have made the point that fluent reading requires going beyond the mechanics of the reading process, which involves attention to graphic and orthographic information, to extracting meaning from words (e.g. Alderson, 2001; Smith, 1991). Some poor readers apparently have mastered the mechanical aspects of reading, but continue to process the text word by word, not using contextual semantic relations and syntactic information to comprehend meaning (Cromer, 1970, quoted in McLaughlin, M. 1987). The sense of "the psychological reality of linguistic concepts" has been very well expressed by Levelt (1974):

A linguistic concept is psychologically real to the extent that it contributes to the explanation of behavior relative to linguistic judgments, and nothing more is necessary for this. Although the term {psychological reality of linguistic concepts} is misleading, it does indeed have content in that it refers to the question as to whether constructions which are suited to the description of one form of verbal behavior (intuitive judgments) are equally suited to the description of other verbal processes (the comprehension and retention of sentences, etc.).

Psycholinguistics is concerned broadly with how linguistic knowledge is acquired (developmental psycholinguistics), how it is put to use in comprehending and producing utterances (language processing) and how it can be impaired by brain injury (aphasia) (Johnson and Johnson, Encyclopedic dictionary of applied linguistics, 1998). So, psycholinguistic approaches to language are quite varied, from those that are concerned with the more concrete operations of the psychological systems involved in producing and perceiving language signals to the more abstract cognitive systems, including memory, which are involved in the construction and interpretation of messages (Garman, 1990).

A basic adoption of linguistics is that sentences are not merely strings of words, but *structured* strings of words consisting of hierarchies of units. This notion of constituent, or phrase structure of sentences has been brought into the psychological laboratory by Fodor, Bever, and Garrett (Fodor and Bever, 1965; Garrett, Bever and Fodor, 1966). Human languages are organized in hierarchies of several levels. There are levels of language: from discourse, to sentence, to phrase, to sub phrase, to word, to word part, to meaningless separate sounds, to distinctive features of sounds. This brings us to a sort of grammatical theory which we can try out for adequacy: "phrase structure grammar" (Slobin, D. I., 1971).

Slobin (1971) defines "constituents" as the segments of the sentences which can be treated as units. Wekker, H. and Liliane, H. (1995) define "constituents" as hierarchical organization of a sentence.

In their experiment Fodor and Bever (1965), conclude that their findings "appeared to demonstrate that the major syntactic break plays an important role in determining the subjective location of noises perceived during speech, "thus supporting the hypothesis that "The unit of speech perception corresponds to the constituent." Similar conclusions are reflected in studies of speech perception (Lieberman *et al.*, 1967) and demonstrated the psychological reality of constituent structure.

Much psycholinguistic research in the early and mid-1960s was based on transformational grammar. This research was guided by the belief that the structures and rules of transformational grammar were psychologically real; that is, they were a part of how people comprehend and produce language (Carroll, 2004, p. 37). Carroll (2004) defines "Psychological reality" as "The way in which

how people comprehend and produce language. The reality principle is concerned with the substance of sentence, the ideas being talked about. According to the reality principle, listeners interpret sentences in the belief that the speaker is referring to a situation or set of ideas they can make sense of (Clark & Clark, 1977). One of the reasons to adopt the goal of psychological reality is the fact that one cannot arrive at a plausible overall understanding of the nature of language, its structure and functions, without considering the psychological aspects. For example, conditions on the production and perception of strings may explain why certain syntactic structures are excluded, while others are preferred (Anward, 1979).

So, as stated by Elgin and Perlinell (1979), the goal of psychological reality is that of accounting for the fully competent speaker's way of organizing his knowledge of his language.

It has been revealed that the presence of phrase boundaries is important in the perception of sentences. To elaborate, it has been found that the unit of speech perception and production corresponds to the linguistic segments, i.e. constituents.

What this study finds out is that the comprehension of the sentences would be easier by EFL learners (here, by native speakers of Farsi learning English) once each line contained a relatively unified phrase and once major syntactic breaks occurred between, rather than within, the line.

Since, constituents have psychological reality, then their physical arrangement must affect reading comprehension of a text. And this study is based on this hypothesis.

So, if it is proved that physical arrangement of texts is benefiting in increasing reading comprehension, then in order to prevent students from being discouraged and to avoid problems of using dictionaries or inference the meaning of unknown words from the text, they can be given awareness of different reading strategies of which one of this strategies is making students aware of constituent structure, which in this study it is believed that it can help and improve comprehension of the passages by making clear the boundary between noun phrase (NP) and verb phrase (VP).

As a result learners may be taught to pay special attention to the constituents in the sentences they read. So, it is suggested that when sentences are divided into constituents by pauses or printed lines, listeners appear to understand more easily because these breaks help them do what they eventually do anyway: isolate and identify each constituent.

Research Questions

The current research was undertaken to determine the effect of syntactic modification (breaking down the constituent) on Iranian EFL Learners reading comprehension.

On the basis of views held by scholars mentioned in the previous sections - the study aims at testing the following research questions which are formulated:

1. Does physical arrangement of constituents play an important role in student's sentence perception and that EFL enterprise can enhance student's information – processing and perception by techniques of constituency – awareness on the part of Iranian EFL students?
2. Is there any difference between different types of physical arrangement of constituents (breaks Between constituents & breaks Within constituents).

Based on the above research questions, the following null hypotheses are presented:

- H0. The physical arrangement of constituents does not affect reading comprehension of Iranian students who are learning English as a foreign language.
- H1. There is no difference between different types of physical arrangement of constituents (Between & Within) at 0.05 level of significance.

2.0 METHOD

Subjects

The subjects of this study were selected from among the undergraduate students of English Language from Ghaemshahr Azad university. In the present study, subjects were all junior EFL students and since they were all majoring at their seventh semester in English, they have passed the required course to acquire skill and knowledge in reading comprehension. It would be of more importance that the students be at higher level of language knowledge, so that better conclusion is reached. The total number of subjects in this study were 190, of either sex. The sample was randomly selected from among different classes. For the purpose of the study, a Michigan English language proficiency test (1992) was administered in order to ensure their homogeneity and determine their language proficiency level.

After administering the Michigan test comprising vocabulary, grammar and reading comprehension items, 80 students were excluded because their scores were lower than one standard deviation above the mean. Also, 20 students were excluded for the pilot study which we will discuss about it later.

Then, the remainder 90 students were randomly assigned to three groups, each consisting of 30 students. The first two groups received two different types of the same text, (one with breaks between constituents, and the other with breaks within constituents). The third group received an intact form. In order to verify the homogeneity of all students in each group, the mean scores of each group on the Michigan test (1992) were analyzed. The results indicated that there is no significant difference among the Michigan scores of the three groups.

Instrumentation

The instruments used in this study were as follows:

A) Language proficiency test: A 100-item standard Michigan Language Proficiency test (1992) aimed at measuring the students general knowledge of basic vocabulary, grammar, and reading comprehension was used. All parts were in the form of multiple – choice questions. The Michigan test was used to determine the level of the students in terms of their proficiency in language and to make a homogeneous group. The first part of Michigan proficiency test was that of grammar which involved 40 questions and the subjects were supposed to attempt them in 40 minutes. The second part, that of vocabulary, contained the same number of items and again the same amount of time was allocated. The third part, a test of reading comprehension, consisted of 20 items posed from four different passages to be attempted in 30 minutes.

B) Test of reading comprehension: The students were given a reading comprehension test. In this section, six passages each containing five multiple choice items, were given to the three groups of student. For the first group, the passages were arranged in a way that there was a break at major constituent boundary (between constituents), for the second group, again the same passages but a break within each constituents, and for the third group again with the same passages in their original form (intact from).

For the adoption of these reading comprehension passages the following characteristics were considered: In order to ensure the difficulty level of this test, Fog's readability formula was run for 12 passages taken from (Michigan ECPE, 1997) to obtain an index of readability for them. The mean index turned out to be 7.86. Then the readability formula was run for the test of Michigan ECPE which was 8.19 and seemed appropriate for the purpose of this study and the correlation coefficient

between the Michigan test of proficiency and the test of reading comprehension was (Michigan ECPE) calculated in the piloting stage. In order to have a valid test, concurrent validity, this test of reading comprehension turned out to be appropriate for this study. Also, item characteristics, that is item facility and item discrimination were measured to have the most appropriate test.

Design

The design of this study is ex post facto because there is no treatment applied in this study and also because it attempts to find the causes for and outcomes of differences that exist in groups of individuals. The physical arrangement of sentences is considered as independent variable through which students' reading comprehension in English will be measured.

Procedure

Since the subjects participating in this study were all majoring at their seventh semester, it was believed that they have the knowledge concerning constituents, constituent's boundary, and etc. This knowledge is considered necessary for the present study.

Also, it must be mentioned that, since the effect of knowing constituents boundary on reading is going to be tested in this study, all three groups received the same passages with different modifications imposed on them (except the third group with intact form).

The question which will be directly tested in this experiment is whether the subjects will be able to improve their reading comprehension concerning constituents boundary, if yes, which one is most beneficial: a break between constituents or a break within constituents.

Based on the above discussion, the following procedures were followed to carry out this study:

First, the general Michigan test consisting of 100-item was administered to 190 subjects. The time given was 110 minutes and the subjects were explained on how to answer the questions. Also, no penalty was for wrong answers.

After administrating the test, each subject was given a score based on his/her performance on the test. Out of 190, 110 students whose scores were one standard deviation above the mean were selected. They were considered as advanced learners. Then 20 students who participated in the pilot study were excluded from the main study. Table 1 presents more information.

Table 1 Statistics for the Michigan proficiency test

Test	DF	Mean	Std. Deviation
Michigan	290	80.25	6.01

Third, these 90 students were randomly divided into three groups with the same level of proficiency. The homogeneity of the groups was confirmed through statistical technique of one – way ANOVA.

Then six passages of reading comprehension selected from Michigan test were rendered to three groups, each containing five Multiple - Choice items. As we noticed before, one with breaks between constituents, the other with breaks within constituents and that of intact form. On the basis of these types of texts, the efficacy of the two methods of breaking constituents were determined. Students in all three groups were not aware of any possible difference among passages.

Also it is to be mentioned that in order to make students encouraged in the second part of administration, they were told that they would be given a prize for one who obtained the highest score.

Piloting

Before an instrument can be administered to the research subjects, it needs to be tried out. The aim of try- out (or pilot) as Seliger and Shohamy (1989, p. 195) state is "to assess its quality while it can still be revised and improved and before it is used with the actual subjects in the research. The researcher collects information about the instrument, its items, and the criteria for scoring and rating its items, and this provides the basis for improving the instrument." In order to choose six of twelve passages that were appropriate in difficulty and content and for use in the main study, and to study different types of modification and difference passages a pilot study was conducted. First of all 12 passages were selected from Michigan proficiency test (1997) and by using the index readability, the existence of any probable difference among passages were checked and passages were selected. 20 Students who were excluded from the main study at the same proficiency level were chosen and given the same test. The rational behind it was to validate the newly developed test against the criteria, i.e., Michigan test (1992).

Then KR-21 formula was used to estimate the reliability of the test, and finally scores of the newly developed test were correlated with those of proficiency test to make sure of its reliability. Table 2 shows the results.

Table 2 Descriptive statistics for the result of pilot study

Test	Mean	Std. D	Reliability	DF	Correlation coefficient
Reading	43.1	4.50	0.632	19	0.6215
Michigan	80.25	6.01	0.611		

Ensuring that there was no difference among passages, modification of passages were conducted.

Data Analysis

In this study, two sets of data were collected: First, Michigan multiple choice standard test of language proficiency; second, a reading comprehension test (6 passages) was administered to three groups. Since all the questions were in the form of multiple choice, scoring was quite objective. Moreover, no penalty was marked for the wrong answers.

After collecting the necessary data, they were analyzed. First, one – way ANOVA was used to determine the differences between the mean test scores of the three groups. Finally, a Scheffe test was used for comparing means of subjects in different types of texts.

3.0 RESULTS AND DISCUSSION

As shown by the mean scores on the 30-item comprehension test, subjects who read the passages arranged on the basis of break Within Constituents scored highest, followed by those who read version of passages arranged based on the break Between and then those who read the Intact passages scored the lowest.

Table 3 Descriptive statistics for three versions of the same passages

Passage Type	N	Mean	Std. Deviation
Intact	30	8.20	4.326
Between	30	10.47	2.825
Within	30	11.73	3.290
Total	90	10.13	3.793

By conducting one – way ANOVA we can examine the difference among the means and decide whether those difference are likely to happen by chance or by a real factor.

Table 3 indicates the results of ANOVA for the effect of physical arrangement of constituents on reading comprehension performance.

Table 4 ANOVA table for the effect of physical arrangement of constituents

Source of variance	Sum of squares	D.F	Mean squares	F-Observed	F-critical	Sig
Between groups	192.26	2	96.13	7.68	3.11	0.001
Within groups	1088.13	87	12.50			

As presented in Table 3, the F-observed value for the effect of physical arrangement of constituents, 7.68 at 2 and 87 degree of freedom is greater than the critical value of F, i.e. 3.11 at 0.05 level of significance.

These results imply that there is a significant difference between the performance of readers on modified texts on the basis of constituency and unmodified (intact) texts.

As the results of the above analysis, the first null hypothesis suggesting that there is no effect of physically arranged sentences on reading comprehension test administered in this study is rejected. It can be concluded that physical arrangement of sentences on the basis of constituency affect students performance on reading comprehension. In other words, physical arrangement of sentences on the basis of constituency seems to be a good method of enhancing Iranian EFL students' reading comprehension.

Subsequently, the post-hoc Scheffe test was employed to locate the exact places of differences in different versions of the modified passages.

Table 5 The Scheffe test for comparing means of subjects in different types of texts

Comparison	Mean	D.F	T-Observed	T-Critical
Intact	8.20	27	5.97	3.35
Between	10.47			
Intact	8.20	27	9.28	3.35
Within	11.73			
Between	10.47	27	3.31	3.35
Within	11.73			

Table 4 shows, the t-observed for Intact and Between passages is 5.97 and this value of t exceeds the t-critical (3.35), implying that the group with passages of breaks Between constituents performed significantly better than students with Intact passages. The comparison of Intact and Within

represents that t-observed value is higher than t-critical value (that is, $9.28 > 3.35$), so the rejection of first null hypothesis was confirmed again. The t-observed value for the comparison of Within and Between passages is 3.31. As can be seen, this amount of t-observed is lower than the critical value of t (i.e., $3.31 < 3.35$). Therefore, the second null hypothesis formulated in this study was not rejected and this implied that there is no difference between Iranian EFL readers of modified versions (Within constituents and Between constituents).

Concerning the questions raised, it was found that by arranging sentences in a way that was explained, we can improve students' reading comprehension of texts. Thus, physical arrangement of sentences on the basis of constituency - awareness has a positive effect on making their reading ability better.

Therefore, if we want to help unsuccessful readers to read more efficiently, first we should help them with their language ability, and then by providing them the physically arranged sentences on the basis of constituency.

As a result, by giving awareness of constituents to the students in reading skill, along with making them conscious of their innate ability, we can give them a broader sense of the importance of reading comprehension tests and improve their reading ability.

Rivers (1981) believes that reading is a crucial activity for expanding knowledge of language, but only under certain condition (p.263).

One of the most challenging and disputable issue which is raised by some ESL/EFL researchers is how to improve student's written input (here, reading). The findings of this research suggest one possible answer for the above statement: physical arrangement of sentences on the basis of constituents increases the reading comprehension of students at advanced level. Although physical arrangement of the sentences of a passage changes its form and makes it longer compared to that of Intact (original) form, but arrangement of sentences in a way which is explained in this study, can compensate for the greater length and changes of the form and seems to make the comprehension of written input better.

4.0 CONCLUSION

As far as the findings of this research is concerned, in order to have a competent second/foreign language reader and in order to develop efficient reading habits in students, teachers should provide them with some techniques and practices on how to approach foreign language texts. If one recognizes the need for a second/foreign language program to use some type of modified input to reduce learners inadequacies, efforts should aim to enhance comprehensibility while maintaining necessary features typical of unmodified written input. In doing so, physical arrangement of sentences of a passage based on constituency represents an alternative to Intact one.

Based on the findings of this study, syllabus designers and EFL reading material developers as well as English teachers may need to consider that modifying target language written input (physical arrangement of sentences) is an acceptable and reasonable yardstick for the preparation of reading materials.

Also it is predicted that the positive results of this study will hopefully provide the reading teachers with more useful and more effective teaching methodology in teaching EFL reading courses.

Yet those who are in charge of designing tests for students in educational settings may find it to be far more fruitful to put major constituent breaks at the end of each line in the reading comprehension passages to make them difficult. Then, the number of breaks in each text will affect the degree of text difficulty. Insights gained from such studies would be of benefit to teachers and especially material designers.

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