X-Bar Parameter Triggering: Approach to Enhance Syntax Proficiency

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Abstract: This study investigates the effectiveness of presenting syntax parameters in the order of availability based on the X-bar tree hierarchy. It was supposed that presenting and emphasizing the parameters in the order that they emerge in the X-bar tree and “triggering” the X-bar parameters may enhance syntax proficiency. The study was conducted through an English language course attended by 30 participants chosen based on their homogeneous grammar proficiency. The rules were presented to the participants’ directly through examples and grammar exercises and indirectly through class activities. Inferential statistic procedures were used to compare the means of the results for the tests conducted during the course based on the equivalent time series. A significant difference was found in the means and accordingly it was concluded that triggering the X-bar parameters may be used as an effective way to enhance the grammar proficiency in adult second language speakers.

Key words: Syntax Proficiency • X-bar Theory • Second Language Learning • Universal Grammar

INTRODUCTION

Grammar is an inevitable component of language, but learning grammar is an elaborate task. A lot of effort has been done to make this task easier and the existing theories and methods have made great contributions to the grammar teaching syllabi, but this doesn’t prohibit more research based on other ideas and theories to emerge. Linguistic and pedagogical studies on the nature of language learning have led to different theories which have attempted to explain this process. Some language teaching methods and approaches have been conducted using these theories [1-4], known as theory-based teaching approaches. The concepts underlying these teaching methods or proposals can be characterized as theory-based or rationalist in approach [5]. In these cases the theory underlying the method is ascertained through the use of reason or rational thought. Systematic and principled thinking is used to support the method, rather than empirical investigation. These teaching concepts tend not to draw support from classroom results, but rather defend themselves through logical argumentation [5]. The Universal Grammar theory is one of these rational which has the potential to be used as the framework for an effective language teaching method.

According to The National Capital Language Resource Center [6], Language teachers and language learners are often frustrated by the disconnect between knowing the rules of grammar and being able to apply those rules automatically in listening, speaking, reading and writing. This disconnection reflects a separation between declarative knowledge and procedural knowledge. Linguistically, this distinction has been given different names, amongst the most popular being “competence” and “performance”.

Chomsky [7] defines competence as the grammar, or a set of mentally represented rules which is demonstrated by every individual’s understanding of acceptable structures in a language. The actual language produced using grammatical competence is referred to as performance. Language undergoes some processes to emerge from competence into performance. The Universal Grammar (UG) theory describes the speaker’s knowledge of language in terms of principles and parameters [8, 9, 10], which explains that the speaker’s knowledge of a language such as English consists of of a number of general principles and appropriate parameter settings for that language.

Chomsky [7-9] introduced the notion that children are born with a special built-in ability to learn language. This innate ability is called the Language Acquisition Device...
The terms LAD and Universal Grammar (UG), are sometimes used interchangeably although these two notions should be considered separately since UG is included within the structure of LAD. The LAD consists of UG and other elements, namely the triggering data, a regulatory mechanism (biological or cognitive) to make parameters available for setting and an algorithm for mapping the triggering data onto parameter values [11, 12].

This device supposedly contained the main rules for all possible human languages. All the child needs is a small sample from some specific language (e.g. English or Japanese) to be able to add a few language-specific rules. For example, English is said to be a “head first” language because it builds structures like:

The man -> who is wearing -> a hat

Japanese, on the other hand, is called a “head last” language because it builds structures like:

Booshi o <- kabutteiru<- hito
Man the<- wearing who<-hat

According to Chomsky [13], all a child needs to learn is whether the language was a head first or head last language. This would set a parameter in the LAD. The child then only needs to set a small number of parameters to learn the structure of the language.

An important component of Universal Grammar is the principles and parameters theory. It holds that there are some principles that are universal to all human languages and that languages differ from one another depending on the parameters they choose. Parameters are referred to as the specific linguistic choices made by each language [14, 15]. For example, in some languages such as Chinese and Italian, it is not always required to use a pronoun as a subject in order to produce a grammatical sentence. Subjects can be omitted in declarative sentences. Hence, Chinese and Italian are pro-drop languages; conversely, in German, French, English and many other languages, subject must always be present in declarative sentences, these languages being classified as non-pro-drop. The differences among languages are based on their parametric variation [14].

An example of a universal principle is structural dependency, a property common to the syntax of all languages which manifests those sentence operations such as movement which require knowledge of the structural relationships of the words, rather than simply their linear sequences [15]. Therefore, telling someone to ‘front the verb’ to form a yes/no question in English does not work with a sentence such as The man who is waving his right-hand won the race. To form the question, we have to understand the structure of the sentence first by distinguishing the main clause from the relative clause. The structural relationships of words are associated with phrases. Being the primary unit of structure in the sentence, phrases represent mental constructs operating at the deep structure in the human mind. X-bar theory, a foundation for generative linguistics, can best interpret the concept of phrases. It holds that every phrasal category must contain a head. For example, every verb phrase must contain a verb. The verb, a required element in the verb phrase, is the head. X-bar theory is another example of a universal principle [16].

X-Bar Theory: X-bar theory is one of the components of UG which deals with syntax. In the first minimalist paper in Chomsky 1993 the X-bar theory was considered to be fundamental. Chomsky believes that: "UG must provide means to present an array of items from the lexicon in a form accessible to the computational system. This form may be taken to be some version of X-bar theory. The concepts of X-bar theory are therefore fundamental [13]. This means that the X-bar principles exist separately from the operations that form and constrain structural descriptions.

This concept is a component of linguistic theory which attempts to identify syntactic features common to all languages. It claims that among their phrasal categories, all languages share certain structural similarities, including one known as the "X-bar", which does not appear in traditional phrase structure rules. X-bar theory was first proposed by Chomsky [17] and further developed by Jackendoff [18].

According to Chomsky [17] the letter X is used to signify an arbitrary lexical category; when analyzing a specific utterance, specific categories are assigned. Thus, the X may become an N for noun, a V for verb, an A for adjective, or a P for preposition. There are three syntax assembly rules which form the basis of X-bar theory.

- A ‘X’ Phrase consists of an optional specifier and an X-bar, in any order: as shown in Figure 1.
- One kind of X-bar consists of an X-bar and an adjunct, in either order: as shown in Figure 2.
- Another kind of X-bar consists of an X (the head of the phrase) and any number of complements (possibly zero), in any order: as shown in Figure 3.
This structure is used to illustrate all sentences in any language. The example illustrated in Figure 4 shows the structure of an English sentence as an example.

The base theory used in this research is the 1993 version of Chomsky’s universal theory to provide an acquisition sequence based on the syntax tree building rules in the X-bar theory. The hierarchical nature of this system, which is illustrated in the works of Vainikka and Young Scholten [19-21], can be used to lead the learner from the lower levels to the higher levels of syntax. This hierarchy was used as a framework to “trigger” or present the syntactic rules that need to be taught and the order in which they must be presented to the learners to help them to uncover the grammar. In other words the hierarchy was supposed to help the learner to activate the language knowledge in their mind and use it.

This study intends to investigate the possible relationship between triggering the x-bar parameters including word order, null-subject, subject-verb agreement and auxiliary movement and syntax proficiency. Two basic theories underlie this concept. The Linguistic Theory, particularly x-bar theory taken from Chomsky’s Generative Grammar and the Learning Theory of language.

The EFL learners in the classroom who are being taught a new language may learn the grammatical rules and structure, but when required to apply their knowledge and understanding, their language learning abilities do not resemble this knowledge [22]. The main problem that still exists, despite all the effort made in developing and implementing different methods for teaching grammar, is that whilst language learners may learn the grammatical rules perfectly and achieve high scores in grammar proficiency tests, their actual oral and written performance is often deficient due to grammatical incompetence. This phenomenon has been closely examined and research, some of which is quoted here, has tended to support this contention.

Based on a study done in The National Capital Language Resource Center [6], Language teachers and language learners are often frustrated by the disconnect between knowing the rules of grammar and being able to apply those rules automatically in listening, speaking, reading and writing.

The findings of a study done in the Beijing International Studies University during 2001 to 2008 [23], states the learners with higher grammar proficiency do not necessarily have higher oral proficiency. Many learners who perform well in a grammar test are deficient in natural oral communication. This supports the earlier suggestion that many second/foreign language learners know a lot of grammatical rules, yet do not speak the language fluently.

According to Willis [24] Grammar follows actual rules but learning how the language works takes a great deal of effort for anyone. Students work very hard to understand grammatical concepts. Some people need a lot of explanation before they finally get it.

Hu [25], argues that compared with form-based approaches in L2 teaching shows that communicative language teaching enables learners to perform spontaneously, but does not guarantee linguistic accuracy of the utterances. In contrast, form-based approaches focus mainly on linguistic and grammatical
structures, which are believed to make the speech more grammatical and accurate. However, this accuracy can only be observed in prepared speeches and the language learners often lack the ability to produce satisfactory spontaneous speeches.

The objective of this research is to test the effectiveness of an approach for teaching English grammar based on the syntax component of the Universal Grammar which is called x-bar theory and to determine students’ progress in syntax proficiency during exposure to the grammatical rules according to the parameter settings of the x-bar theory.

**MATERIALS AND METHODS**

The quantitative design chosen for this study was the equivalent time series design. In any given experiment, the number of participants may be limited and it may not be possible to involve more than one group. In these cases, researchers study a single group using a within group experimental design. This type of design assumes several forms: time series, repeated measures and single subject designs [26-28].

When an experimental researcher has access to only one group and can study them over a period, a time series design is a good experimental approach; this design consists of studying one group, over time, with multiple pretest and post-test measures or observations made by the researcher. It does not require access to large number of participants and it requires only one group for the study. However, this design is a labor intensive because the researcher needs to gather multiple measures.

There are 2 models of time series design: interrupted time series design and equivalent time series design, the second of which was considered suitable for the present study. In the equivalent series design the investigator alternates a treatment with a post-test measure. The data analysis then consists of comparing post-test measures for plotting them to discern patterns in the data over time. The time series design permits significant control over threads to internal validity. History effects were minimized by the short time intervals between measures and observation [26, 27]. The design of the study was the equivalent time series design as illustrated in Figure 5.

**Participant Selection:** Based on the nature of the X-bar theory underlying this study the participants should have specific linguistic characteristics and they should be willing to take part in the research for one whole academic semester. They must be of the same first language background, they should be adults in the same age range and they must be in almost the same English proficiency level. For these reasons the purposive homogeneous sampling is a suitable approach for this particular study. The target population was defined as the Iranian post-graduate students in University Putra Malaysia. 30 participants were chosen from this population based on the required criteria mentioned above and a Grammar proficiency test (Oxford Placement Test). Five of the participants left the course before the post-test so they were excluded from the final analysis.

**Procedures:** The participants took part in an English language course. The grammatical rules were arranged based on the x-bar theory beginning with VP related parameters and leading to IP and CP related parameters. The parameters were triggered both explicitly via examples and grammar exercises and implicitly using different activities based on speaking and writing. The researcher closely monitored the participants’ grammatical behavior and the participants were not rushed through the rules. The VP parameter triggering was continued until the observations showed that the learners had mastered the parameters. At this point a grammar test was conducted to assess the learners’ progress as the first phase of the time series design. The same procedure was followed for the second set (IP-related) and the third set (CP-related) of the parameters.

The course was held for one semester covering 14 sessions. The results of these 3 post-tests were compared together and with the pre-test. This comparison, which shows the gradual progress of the participants in grammar proficiency, is illustrated in chart 1. To ensure the significance of the difference among the results of the 4 conducted tests the results were put through statistical analysis. A t-test was used to compare the pre-test and the post test. The pretest, post-test and the 2 intermediate
test results were compared using ANOVA. The results and the findings are presented in the results and discussion section.

**RESULTS AND DISCUSSIONS**

A t-test was conducted to compare the means of the results for the pretest and post-test. These two tests were dealt with separately because they were two different versions of the Oxford Placement test (OPT). The use of OPT as a L2 proficiency test has been justified in previous researches such as Wistner [29]. To ensure the relevance of this test, the test items were analyzed. As the test included all the related X-bar theory parameters in random order, it was considered relevant to the scope of this study. The comparison of the results showed a significant difference between the means which emphasizes the participants’ improvement and the effectiveness of the triggering on grammar proficiency. ANOVA analysis was used to ensure that the progressive results of the participants throughout the course have been significant. By ensuring the significance of the differences in the test results it can be claimed that the method used to facilitate the grammar learning has been successful. The results of the statistical analysis are tabulated in Tables 1 to 5.

The objective of this study was to test the effectiveness of an approach for teaching English grammar based on the X-bar Theory, the syntax component of the Universal Grammar. The assessment of the participants’ progress in syntax proficiency during exposure to the grammatical rules according to the parameter settings of the x-bar theory showed that this approach can be helpful in facilitating and enhancing grammar learning. The results of the study can be used to improve the grammar teaching/learning process in the second language curriculum. The order of the presenting the syntax rules, giving them due time to master each set of parameters before enforcing the higher level ones and involving the learners in tests assessing the learning of each set of the parameters in the proper time can help both the adult second language second learners and teachers. It should be mentioned however, that this study suffers from some limitations including the restrictions on the sample, the first language used and the short time of involvement of the participants. Other research can be conducted based on other first and second languages with larger samples. On the other hand, conducting a longitudinal study, giving researchers the opportunity of following up the participants’ progress over a longer period and using the participants’ feedback can be very helpful in enriching the second language learning curriculum with regard to syntax learning.

<table>
<thead>
<tr>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post_Test</td>
<td>75.0000</td>
<td>25</td>
<td>12.11060</td>
</tr>
<tr>
<td>Pre_Test</td>
<td>53.1200</td>
<td>25</td>
<td>9.87978</td>
</tr>
</tbody>
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Table 1: Paired Samples Statistics

<table>
<thead>
<tr>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
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<tr>
<td>Pair 1</td>
<td>Post_Test&amp;Pre_Test</td>
<td>.503</td>
</tr>
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</table>

Table 2: Paired Samples Correlations

<table>
<thead>
<tr>
<th>Paired Differences</th>
<th>95% Confidence Interval of the Difference</th>
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<tr>
<td>Mean</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td>Pair 1</td>
<td>Post_Test - Pre_Test</td>
</tr>
</tbody>
</table>

Table 3: Paired Samples Test for Pre-Test and Post-Test

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
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<tbody>
<tr>
<td>4.794 *</td>
<td>4</td>
<td>11</td>
<td>.017</td>
</tr>
</tbody>
</table>

a. Groups with only one case are ignored in computing the test of homogeneity of variance for Test.2.
Table 5: ANOVA for Achievement Assessment During Intervention

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>3250.993</td>
<td>13</td>
<td>250.076</td>
<td>5.975</td>
</tr>
<tr>
<td>Within Groups</td>
<td>460.367</td>
<td>11</td>
<td>41.852</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3711.360</td>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

REFERENCES

