

# SYNTACTIC TREE DIAGRAM: STUDENTS' PROBLEMS AND THE CAUSES

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## ABSTRACT

Syntactic tree diagrams are used to help students recognize and analyze sentence structure. This study aims to discover students' difficulties in constructing syntactic tree diagrams of simple sentences. The descriptive qualitative approach was implemented with six English Department students participating as research participants. The data was gathered using interviews as the primary instrument and tests as the secondary instrument. The findings of this study show that students have six problems when constructing the syntactic tree diagram: determining phrase structure rules, placing words and phrases, determining word classes, drawing the diagram of long sentences, drawing arrows on the syntactic tree diagram, and identifying sentences with ambiguous meaning. Furthermore, some factors, such as insufficient knowledge of tree diagrams, the classroom environment, and a lack of confidence, contribute to students' difficulties in drawing the syntactic tree diagram of simple sentences. In light of the findings of this study, it is proposed that students practice constructing the syntactic tree diagram. Furthermore, lecturers are expected to give students more practice constructing syntactic tree diagrams in order to improve their ability to analyze sentence structure.

## KEYWORDS

Syntactic Tree  
Diagram,  
Students' Problems.

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## 1. Introduction

From the linguistic perspective, Syntax has a similar scope of study as morphology. They both study grammar. The difference is that morphology examines the grammatical relationships that exist in words to sentences. Meanwhile, syntax studies the grammatical relationships beyond word boundaries in sentence units. Syntax is the study of sentence structure. According to Fromkin et al., (2003), syntax is the aspect of grammar that reflects a speaker's understanding of the elements necessary for building phrases and sentences from morphemes and words. In line with this assertion, Carnie (2013) contended that syntax is the study of the level of language that exists between words and the meaning of utterances: sentences. It is the level that bridges the gap between the sounds someone makes (which are grouped into words) and what they need to express. These two theories indicate that syntax focuses on how sentences are constructed through several elements called phrases.

Regarding the concept of the structure and elements of a sentence, Chomsky in 1957, coined and popularized the concept of transformational-generative grammar to describe a language analysis system that acknowledges the relationship between various sentence elements as well as among sentences in a language and expresses these relationships using processes or rules (some of which are called transformations). Chomsky (2002) clarified that the fundamental idea of transformational generative is the distinction between deep structure and surface structure, which is established by the application of a particular formal procedure through recursion, also known as "grammatical transformation" at the lowest basic object.

Fowler (2017) asserted that deep structure is related to meaning whereas surface structure is related to the arrangement of elements and hence to sound since, in practice, the surface structure indicates the order of sounds that appear in a phonetic realization of a sentence. Therefore, the deep structure is related to semantics while the surface structure is related to phonology, but both of them are discussed in sentence structure. On the other hand, Fowler (2017) also described transformational rules are used to underlying phrase markers to generate derived or surface phrase markers. As a result, phrase markers can indicate both deep and surface structures. A phrase marker is a tree diagram representation of an element in a sentence.

In syntax, a tree diagram allows students to recognize the structure of a sentence and analyze it based on its surface structure and deep structure. The ability to draw syntactic tree diagrams can therefore be used as a measure of a student's ability to analyze sentences and sentence structures. If they can illustrate each element of a sentence in a tree diagram, it indicates that they have a thorough understanding of each element, from the word level to phrases.

Nevertheless, many students claimed that drawing tree diagrams is difficult. It is based on early observations made by the researchers among English Department students. This observation showed that, while some students believed that evaluating words using tree diagrams was simple, the majority of them still struggle with it. This fact inspires researchers to go deeper into the difficulty students have when analyzing simple sentences using tree diagrams, in order to identify the types of issues they face when learning syntax, particularly when analyzing sentences using tree diagrams.

Some researchers conducted the research in the same area (syntactic tree diagram). Derrick & Archambault (2009) analyzed TreeForm: explaining and exploring grammar through syntax trees. The research focused on the treeform as a tool to develop the syntax trees; complete with movement lines, coreference, and feature association. In this research, the researcher asked several students and professors to draw a tree diagram using a treeform. Besides that, the researcher also asked them to draw a tree diagram using other tools. After that, the researcher analyzed the results by comparing the effectiveness of those tools. Therefore, the research aimed to determine whether the treeform was effective for developing tree diagrams or not. The other previous research was carried out by Wang (2010) who investigated the problems and suggestions related to learning about tree diagrams, entitled "Drawing Tree Diagrams: Problems and Suggestions." This study explored general problems that often occurred when students constructed tree diagrams. The research was conducted by reviewing the students' exam sheets and analyzing the problems that often occurred when students constructed tree diagrams. Christianto (2018) additionally conducted research on the syntactic analysis of sentence patterns in John Denver's song lyrics. This study employed syntactic tree diagrams to analyze sentence patterns in the song lyrics of John Denver.

Different from previous research, this study investigates the students' problems in sentence analysis using the syntactic tree diagram by focusing on the process of how students analyze each element in simple sentences and illustrating the deep structure of sentences in the tree diagrams. This research presents the students' problems in analyzing sentences through tree diagrams and the causes of those problems by involving the sixth-semester students of English Department as the research participants.

The results of the study can provide benefits for the syntax lecturers to be the guideline for recognizing the students' problems in analyzing sentences through the syntactic tree diagram. On the other hand, the results of this study can also provide input regarding the causes of the students' problems in constructing the syntactic tree diagram so that the lecturers can do the learning exploration to find the best method for teaching syntax. It aims to minimize the students' problems in analyzing sentences through tree diagrams. In addition, the result of this study can also minimize the students' problems in drawing the syntactic tree diagram through the students' awareness of their ability, so that the students can understand how to overcome their problems well.

## 2. Method

This study applied a descriptive qualitative method to investigate students' problems in analyzing simple sentence structures using tree diagrams. According to Fraenkel, Wallen & Hyun (2012), qualitative data is primarily acquired in the form of words or images, with few exceptions using statistics. Therefore, the qualitative method was considered suitable to be applied in this research.

This study took six students of English Department as research participants because they were available and they also had studied English syntax, especially about the syntactic tree diagram of simple sentences in the fifth semester.

The research data were collected through two instruments; the first was an interview that provided information about the students' problems in constructing syntactic tree diagram, and the second instrument was a test to explore students' problems more deeply. In other words, the data in this study are students' responses in interviews and student answers in tests.

The results of data collection were analyzed using thematic analysis. According to Braun & Clarke (2006), there are six stages to conduct a thematic analysis: (1) Familiarizing with the data; a stage to read and read again the transcript of the interview result until the researchers are familiarized with the data, (2) Generating initial codes; after familiarizing with the data and taking notes of the coding, the researchers started to classify the coding based on their groups. It aims to help the researchers to continue to the next stage, (3) Searching for themes; in this stage, the researchers used visual representation like a table. It aims to help the researchers in sorting the different coding into themes, (4) Reviewing themes; the stage in which the researcher reads again the themes to see whether they form an organized structure or not, (5) Defining and naming themes; a stage in which the topics presented for analysis are defined and refined, and data within them are analyzed. The researchers named the themes since the names were utilized to examine the data in the final analysis, (6) Producing the report; this stage explains the outcome of the data analysis. Data reported in this stage are acquired from interviews that have gone through multiple preceding phases.

### 3. Results and Discussion

#### 3.1. Results

##### Students' Problems in Analyzing the Structure of Simple Sentences Using the Syntactic Tree Diagram

Table 1 presents the findings regarding the problems that the students had when analyzing the structure of simple sentences utilizing the syntactic tree diagram. The table consists of codes and themes. The codes are determined on the basis of the replies given by the students regarding the problems they encountered when drawing the syntactic tree diagram. The codes are then categorized into some themes.

**Table 1.** Students' Problems

<b>Codes</b>	<b>Themes</b>
Determining Verb Phrase (VP) and Noun Phrase (NP)	The problem in determining phrase structure rules
Determining Prepositional Phrase (PP)	
Discovering/Analyzing an auxiliary verb	
Determining/placing Verb Phrase (VP) and Noun Phrase (NP)	The problem in placing words or phrases
Determining/placing Noun Phrase (NP) and Prepositional Phrase (PP)	
Determining the word classes	The problem in determining the word classes
Determining adverb and adjective	
Analyzing long sentences	The problem in drawing the tree diagram of long sentences

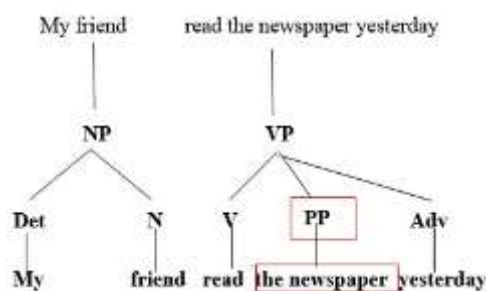
Pulling arrows on the syntactic tree diagram	The problem in pulling arrows on the syntactic tree diagram
Identifying ambiguous sentence	The problem in identifying ambiguous sentences

### The Problem in Determining Phrase Structure Rules

In learning about sentence structure analysis, students should be first given an understanding of phrase structure rules to make it easier for them to analyze the sentence structure. The following interview result shows that the students still have problems in identifying phrases and their structures in sentences.

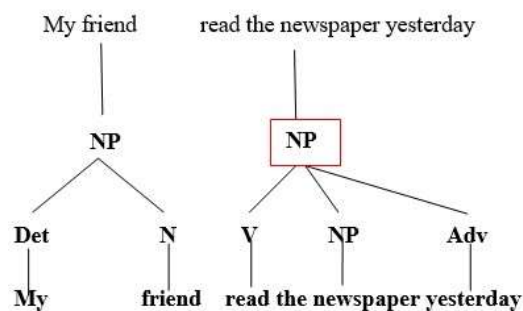
*“ ... It is difficult for me to determine and identify the structure of phrases in sentences, and as a result, I find that it is tough for me to analyze them through tree diagrams.”*

The participant's answer is evidenced by the test results which also show that Participant 5 identifies the word "the newspaper" in the sentence "My friend reads the newspaper yesterday" as a prepositional phrase, while it is a noun phrase:



**Fig 1.** Students' Answer in Test

Likewise, participant 2 determined the phrase "read the newspaper yesterday" as a Noun Phrase (NP), while it is a verb phrase:



**Fig 2.** Students' Answer in Test

In addition, participant 2 added that she was confused when dealing with an auxiliary verb in a sentence and had problem analyzing it through the syntactic tree diagram.

*" ... my friends and I usually find it difficult to analyze a sentence that has two verbs, for example in the sentence "I can cut your hair". ... we got problem to place both verbs in the tree diagram."*

This statement is evidenced by the results of the test on Participant 2 who placed the modal "will" as part of the noun phrase in the tree diagram, and not as part of the verb phrase.

### The Problem in Placing Words or Phrases

In addition to having problems in identifying the phrase structure rules, some participants also found it difficult to place words and phrases based on their categories. Furthermore, participants 6, 2 and 5 stated that they found it difficult to place Verb Phrase (VP) and Noun Phrase (NP).

*"... In most cases, it is difficult for me to determine where the VP and NP branches should be located in tree diagrams.."*

This problem can also be seen in the test results which show that in the sentence "My friends read the newspaper yesterday", some participants put the noun phrase "My friends" and the verb phrase "Read the newspaper yesterday" interchangeably:

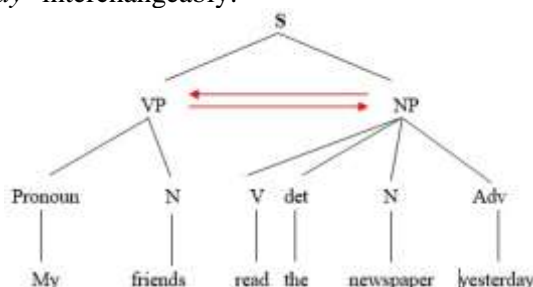


Fig 3. Students' Answer in Test

In addition, they also place noun phrases and prepositional phrases interchangeably, such as in the sentence "She has taken my money from my wallet", where they place the prepositional phrase "from my wallet" as a noun phrase:

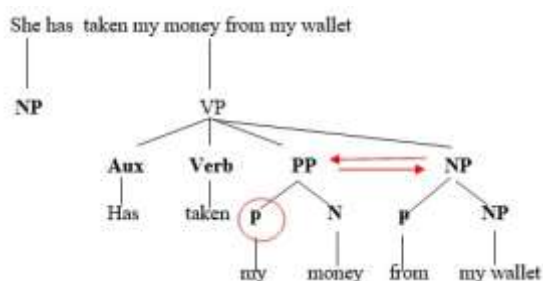


Fig 4. Students' Answer in Test

### The Problem in Determining the Word Classes

In analyzing sentences using a syntactic tree diagram, students also have problem determining word classes. Certain word classes are often classified interchangeably and incorrectly. Here are the answers from some of the participants in the interview.

"In my opinion, determining the word class is a really difficult task..."

"... the problem I experience when drawing a tree diagram is like determining whether a word is an adverb or an adjective ..."

The responses indicate that the students had problems in determining word classes such as Adverb (Adv) and Adjective (Adj), especially when the word class is part of a phrase. One example found in students' test results is in the sentence "The big house has a beautiful garden"; where the word "big" and "beautiful" are identified as a noun:

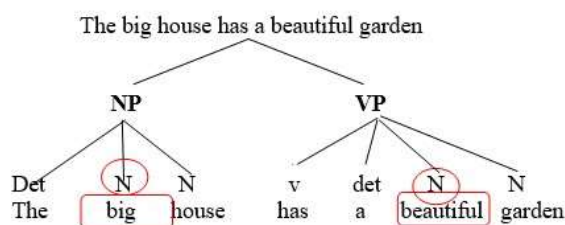


Fig 5. Students' Answer in Test

### The Problem in Drawing the Tree Diagram of Long Sentences



Another problem faced by students in analyzing sentences using tree diagrams is when they find long sentences to analyze, as their answers during the interview.

*"When I have to analyze long sentences, for example, a simple sentence that includes two PPs, AdvP, or AdjP, I find that to be particularly challenging. When it comes to putting the structure into a tree diagram, I never know how to classify it."*

The results of the interview revealed that analyzing long sentences through tree diagrams provided challenges and problems for students, because the longer the sentences, the more phrases used in them. The more phrases used in a sentence, the more difficult it is for the students to analyze the structure of the sentence.

### **The Problem in Pulling Arrows on the Syntactic Tree Diagram**

Drawing arrows in a tree diagram is the process of identifying and classifying phrases based on their structure and constituents. In carrying out this process, students still encounter obstacles because they are confused about which direction to draw the arrow of a certain phrase. Here are their answers in the interview.

*"When I draw arrows on tree diagrams I usually get confused about which phrase to draw."*

*"... and when drawing arrows on the syntactic tree diagram I usually get confused about which word to draw the arrow to"*

This indicates that the students' problem in drawing arrows has a relationship with their limited knowledge of phrase structure rules. So, they cannot determine the location of a phrase in a tree diagram.

### **The Problem in Identifying Ambiguous Sentences**

Furthermore, the problems faced by students in analyzing sentences using tree diagrams were when they found ambiguous sentences. An ambiguous sentence is a sentence that has a double meaning, as in the sentence "She killed the man with the tie". In this sentence, it is not clear whether "she" killed "the man" by using "tie" as a means of killing, or whether "she" killed the man who wore the tie. The test results show that the students have various perceptions about the meaning of this sentence. In addition, the results of the interviews also showed that they had some problems analyzing such multiple-meaning sentences. Here are their responses to the interview.

*"I am often confused by sentences that have two meanings. I am confused about which branch to put the double meaning phrase in the tree diagram."*

*"... I always try to be more aware whenever I am analyzing a sentence that has more than one possible meaning. On the other hand, we are frequently deceived and do not see that the sentence has more than one possible meaning.."*

Having knowledge of ambiguity in the meaning and structure of sentences is important for students to make it easier for them to analyze sentences.

### **The Causes of Students' Problems in Analyzing Simple Sentences Using Syntactic Tree Diagrams**

Based on the interview results, it was found that there were several factors that caused the students' problems in analyzing the simple sentence structures using syntactic tree diagrams. Those factors include the insufficient knowledge of tree diagrams, classroom environment, and lack of confidence.

On the first causal factor; insufficient knowledge of tree diagrams, most of the students answered that this was mostly due to the insufficient time for them to study and have practice in class. In addition, the teaching methods of lecturers also do not quite help them to understand the material well. This was revealed through the response of one of the participants.

*"The teaching method that the lecturer applies to teach the class is one of the most essential aspects that impact how easily the content may be understood by the students. It is better if the material that is considered difficult, such as phrase-structure rules, is taught in more detail. So that we can understand it better"*.

In addition, the condition of the learning environment also affects students in learning. The responses from some of the students reveal this:

*“The atmosphere of the classroom is equally important. If some of our friends already understand the material, then some who don't understand will be encouraged to study harder too. In most cases, we ask one another to act as our personal tutors.”*

*“Some of us have a very tough time concentrating on our studies when the learning process is conducted online and we do our work at home. It is difficult for us to be actively participated and involved in the learning process because of this, which is typically caused by the noisy and unsupportive environment at home.”*

From the participants' answers, it can be concluded that the students need a learning environment that supports the learning process, so that they are more focused on learning. In addition, the classmates who support and encourage each other can also be a factor that minimizes the students' problems in learning.

The last factor that causes students problems is their lack of confidence in learning. Here are the participants' answers.

*“Whenever we are given a chance for classroom practice, I typically choose not to take part because I am unsure of my answer and I do not want to mess up. If my response is incorrect, I will feel embarrassed as well....”*

*“I often feel insecure. I am afraid and doubt if my answer is wrong”*

From the answers, it can be concluded that students' problems in learning tree diagrams are also caused by their lack of self-confidence. Their feelings of fear, shame, and doubt become obstacles for them to learn and be actively involved in learning activities.

### 3.2. Discussion

Syntactic tree diagram is an effective tool for identifying and analyzing the deep structure of a sentence. It portrays all and every constituent in a sentence, both the immediate and the ultimate constituents of the sentence. Therefore, analyzing the deep structure of a sentence requires students to have complex and adequate knowledge of all sentence elements. Due to this fact, sentence analysis using tree diagrams is considered difficult for some students. For that reason, this research is aimed at investigating the students' problems in analyzing simple sentences using syntactic tree diagrams.

Through the interview and test, the students' answers were obtained regarding the problems they often face in applying the use of tree diagrams in analyzing sentences. The results revealed that most of them had problems in determining phrase structure rules, placing words and phrases, determining word classes, drawing tree diagrams of long sentences, pulling arrows on the syntactic tree diagram, and identifying ambiguous sentences.

The results of data analysis show that every problem faced by students is related to each other and has an effect on each other. The most dominating problem is determining the phrase structure rules which then has an impact on their ability to place words and phrases in the branches of tree diagrams. Likewise, their problem in analyzing long sentences is due to their lack of knowledge about phrase structure rules as well, so they find it difficult to divide long sentences into phrases. This finding is in line with the results of research from Wang (2010) which revealed that in analyzing sentence using tree diagram, students often incorrectly identify phrase structure rules, and they named the phrases mistakenly.

Likewise, the students' knowledge of word classes affects their ability to classify words and phrases in a syntactic tree diagram. In fact, they often place and name words interchangeably in tree diagrams. Meanwhile, Carnie (2013) has stated that part of speech is the label given to a constituent that will determine the position of a word in a sentence. It means that students' knowledge about part of speech is needed to determine the position of a word in a sentence to be analyzed using the syntactic tree diagram.

Another problem faced by students is interpreting the meaning of ambiguous sentences. As stated by Fowler (2017) that an ambiguous sentence is a sentence that has one surface structure, but undeniably two meanings. So that the students' confusion about the double meaning of such sentence has an effect on their problem in analyzing the sentence structure in the tree diagram. Each student may have a different interpretation of the meaning of an ambiguous sentence, so the results of the tree diagrams they make are different depending on their respective interpretations.

Furthermore, another finding from this research is about the factors causing the students' problems in analyzing sentences using tree diagrams. The Interview revealed that the students' lack of knowledge about tree diagrams, the classroom environment, and students' lack of confidence were the main reasons that led students to the problems in analyzing sentences through tree diagrams.

The first and foremost cause, lack of knowledge about tree diagrams, has an impact on students' problems in identifying and naming the word classes, identifying phrases, and dividing sentences into phrases. Thus, these problems then resulted in the students' problems in analyzing sentence structure using tree diagrams. In addition, students' lack of knowledge about tree diagrams is caused by unsupportive learning environment conditions, which causes them to have problem in understanding the learning material. Moreover, the learning conditions during the COVID-19 pandemic caused students to study in virtual classes. Learning virtually from home is certainly different from learning directly in the classroom. When studying in class with lecturers, students will find it easier to understand the learning materials because they can directly interact with their classmates and the lecturer. Meanwhile, studying from home does not make it easier for them to interact with their classmates and the lecturer. Also, studying in a noisy and unsupportive home environment makes it difficult for them to concentrate.

Lastly, the students' lack of confidence in learning makes it difficult for them to engage actively in learning activities. Due to a lack of confidence, students feel embarrassed to ask for an explanation from the lecturer if they do not comprehend the learning material. When students do not understand the lesson learned, they will not have the motivation to learn. This is what causes them to encounter problems in learning.

To conclude, the finding of this study indicates that for some students, understanding sentence structure as part of a syntax study is not easy. Sentence analysis should involve in-depth knowledge of every sentence-building element such as words and word classes, phrases including their types and rules, and sentences including their types and elements. So that to analyze sentences, students must master all the elements that build sentences. The students' lack of knowledge about sentences and its building elements will certainly lead them to problems analyzing sentences based on its surface and deep structures.

The results of this study are anticipated to be useful for lecturers in identifying the problems and obstacles that students face in the process of learning syntax. As a result, lecturers will be able to anticipate students' problems by employing learning methods and strategies appropriate for the student's learning capabilities. In addition, teachers can make learning more enjoyable and supportive for students, so that students do not perceive studying syntax as a burden. This will help students feel less pressured to learn syntax

#### 4. Conclusion

This study investigates the students' problems in analyzing simple sentences using the syntactic tree diagram. As a result, there are 6 problems experienced by students in analyzing sentences revealed through tests and interviews. The students had problems in determining phrase structure rules, placing words and phrases, determining the word classes, analyzing the long sentences, determining the arrows on the syntactic tree diagram, and figuring out the ambiguous sentences. The interview also revealed several factors that caused students' problems in drawing the syntactic tree diagram, which included insufficient knowledge of tree diagrams, classroom environment, and lack of confidence. It is hoped that the results of this research can be an input for lecturers and students in anticipating and overcoming problems in learning syntax. By applying solutions to students' internal and external problems in learning, every learning problem can be handled properly, and of course learning objectives can be achieved as expected.

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