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Behaviorism and Chomsky's Criticism to Behaviorism

Behaviorism

In modern times the research on mind has oscillated between 'body' and 'mind'. In the nineteenth century, the emphasis was on the mind, and especially on consciousness (the ability to think, creativity of human mind, etc). However, early in the twentieth century, the golden era of consciousness was brought to a close.

From about 1902 onwards, Pavlov carried out his famous experiments on conditioning mainly with dogs to make a living being behave in a particular way. He had noticed that, just before they were fed, dogs salivated (mouth watering) before any actual food was placed in front of them, perhaps they had become habitual of the feeding time. In another similar experiment, Pavlov attached some kind of tubes with dog's tongues, and drained off the saliva that was produced when meat was placed before the dog. He measured it. At the next feeding time, a bell was rung at the same time as the meat was presented, and the saliva measured again. After a number of such incidents in which the bell accompanied the presentation of meat, at a feeding time bell was rung only but no food was presented. The salivation of the dog on this occasion was almost as much as on an occasion when the meat was presented. Previously the smell of meat worked as a stimulus, so the dogs had mouth watering, but now the stimulus had changed, they mouth watered on the bell sound as well. He then concluded that the sound of bell had replaced the smell of meat as a stimulus (an action which is answered by a reaction from a living being). He said that animals can be 'made habitual' or 'conditioned' through 'conditioned stimuli' (e.g. Bell ringing); thus, they will provide the same 'response' as they provided for an 'unconditional stimuli'.

In simple words animals could be trained to provide a certain 'reaction' on an 'action'. This combination would be called 'stimulus-response'. Additionally, the 'response' can be reinforced by 'repetition' (as it was done with dogs by ringing bells again and again along with meat).

Why Behaviorism?

Behaviorism evolved from the tradition of 'empiricism'. Empiricists believed in objective and verifiable data. So, behaviorist psychologists advocated the use of objective and verifiable data. Since one cannot enter into the mind, and cannot reach the thought process

'objectively', so inclusion of 'mind 'was out of question. Thus, behaviorism studied 'verifiable' things i.e. the behavior of humans or other living beings. 'Stimulus-response' was another such attempt.

In a direct contrast with cognitive theory, behaviorism is a learning theory that supports the claim that all learning is a combination of stimulus and response; that teaching and learning follow an input-output model from which the student acquires information through habitual practices and repetition. B.F. Skinner is to behaviorism what Chomsky is to cognitive theory.

B.F. Skinner's Idea

The 'stimulus-response-reinforcement' methodology can be seen in the language teaching method called 'Audio-lingualism'. The students were taught language in terms of 'dialogues' where one had to 'ask' (provide stimulus) and other had to 'respond' (provide response), and the 'behavior' was 'reinforced' by repetition drills of dialogues. This method had a limited functionality i.e. students could learn basic sentences quickly but they didn't have much ability to create new sentences.

Chomsky's criticism

Chomsky is a mentalist. He believes in 'mind' rather than 'body'. According to his approach, there is a need to study the realm of 'thought and mind'. If it cannot be studied 'objectively' and others cannot 'see, touch, feel…' it, then it is the problem with their method of study (i.e. the scientific method).

The study of 'introspection', 'mind' and 'thoughts' cannot be excluded simply because they are not 'verifiable by others'. Thus, Chomsky believes in 'thought' and 'creativity of mind'.

On the hand, Chomsky's perception of human beings is deep and less mechanical. The human being, according to Chomsky, is not a machine, he does not differ from an animal except in his ability to think and his intelligence, but more importantly, he differs in his linguistic ability.

Chomsky was a young man of about 30 years in 1950_s when the book 'verbal behavior' was published by B.F. Skinner. After two years of its publication, Chomsky wrote a critique of this book titled 'A Review of B.F. Skinner's Verbal Behavior'. This review criticized the very basic assumptions of behaviorist theory. Skinner had tried to apply this theory on language, but Chomsky used the same area i.e. 'language' to give a sharp blow to the behaviorist theory.

Skinner explained that child's language is learnt through 'stimulus-response-reinforcement'. That the child simply repeats what the adults tell him, and thus masters the language completely. Chomsky questioned this approach by pointing out the fact that child's

language production is developmental. S /he makes mistakes in this process of learning. S /he makes learns the grammar of language fairly quickly without any explicit instruction. Children make mistakes like 'I goed to the store' during the learning process. If there is no thought process and the learning of language is simply a matter of 'action-reaction-repetition', then how come that a child makes mistakes? Or how come a child learns the grammar of language without any 'formal teaching', as no one ever tells a child to use 'went' instead of 'goed'. They observe themselves and get the 'rules' of language because they have the 'ability' in their mind, and the process of thinking is involved in this regard.

Evidence against the 'action-reaction-repetition' theory is that children produce such sentences which they've never heard in their whole life. How come that they are able to do that? The answer is simple, they do not merely 'repeat' what they have heard, but they 'process' it in their minds and extract the 'rules' which they, then, 'apply' to 'create' new sentences. Thus, Chomsky's ideas about language and grammar can be seen in this critique. Chomsky believed that there is an 'innate ability' in the human mind which enables it to learn language. He called it 'Language Acquisition Device' or LAD which is their in every child's mind. On the other hand, Skinner said that the mind of a child is like a slate when s/he arrives in this world. This world and the surroundings are the factors which 'condition' his/her behavior to respond in a particular way. But Chomsky rejected this point of view by the above presented argument. Chomsky thus, believes in 'Universal grammar' which has common properties in all human minds. As the grammar is 'innate' (genetic) so there must be similarities between all languages of the world, and, in Chomsky's point of view, grammar will find out theses similarities and would be able to explain all human languages.

Conclusion

The debate between Skinner and Chomsky on language acquisition has become a bone of contention because of the longevity of the debate and the questions it reintroduces. But like the truism that in science there are rarely definite answers, there is another truism which could help us come to a compromise. That is the truism and the possibility that is often overlooked, that maybe, both of these men were correct in their suppositions of language. Which is why I contest that we look at the debate from a biopsychosocial perspective rather than from a behaviorist perspective like Skinner, or a structuralist perspective, like Chomsky. By looking at language acquistion from a biopsychosocial perspective we effectively confront this truism, that in life there is often more than one truth. Lastly, it is important to recognize the contributions that a simple disagreement of men have had on psychology. Both Chomsky and Skinner's theories have led to significant scientific advancements. Skinner's theory of language acquisition and his use of operant conditioning to explain how the process occurs has led to very practical real world applications, such as in the classroom or in the workplace . Chomsky's theory of universal grammar has led to and inspired many important studies on idigenous tongues in the Amazon particularly, but also other isolated societies around the world. Such as the study on the Amazon tribe that has no numeracy, which was actually meant to disprove Chomsky, but nonetheless was only conducted because of him . In many ways, the lack of agreement upon which theory is correct has driven both Noam Chomsky and BF Skinner to expand upon their theories, conduct new experiments and studies, and perhaps

most importantly, inspire new generations of psychologists seeking to continue the endless endeavor of understanding language.

Leonard Bloomfield and the Exclusion of Meaning from the Study of Language

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Abstract

In this study the attempt was made to find out whether Bloomfield was only interested in the structural description of language, and therefore he excluded the study of meaning. This was done by the examination of his (1933) published book LANGUAGE which is still considered to be the most relevant study on language ever written, because it covers all traditions of language study – historical-comparative, philosophical-descriptive and practical-descriptive.

The present paper has shown that Bloomfield regarded meaning as a weak point in language study and believed that it could be totally stated in behaviorist terms. For Bloomfield, the context of situation was an important level of linguistic analysis alongside syntax, morphology, phonology, and phonetics, all of which contribute to linguistic meaning. Meaning then covers a variety of aspects of language, and there is no general agreement about the nature of meaning. This paper, therefore, should be considered only as a clarification of Bloomfield's understanding of meaning.

Key words: Context of situation; Traditional grammarians; Behaviourism; Mentalistic psychology; Linguistic meaning; Generative grammar

INTRODUCTION

Bloomfield's approach to linguistics can be characterized by his emphasis on its scientific basis, his adherence to behaviourism, and by his emphasis on formal procedures for the analysis of linguistic data. This approach put the American linguists at dispute not only with rival approaches but also with the wide-spread philosophy and humanities. De Beaugrande emphasizes this aspect in his (1991) published book, he writes "Bloomfield's language fostered in American linguistics a spirit of confrontation not merely against rival approaches,but also against prevailing philosophy, language teaching, and the humanities at large" (83ff).

Bloomfield was annoyed with the philosophers because they "took it for granted that the structure of their language embodies the universal forms of human thought or even of the cosmic order, and looked for truth about the universe in what really nothing but formal features of one or another language" (1933, p.5). Philosophers then confined their grammatical observations to one language and stated them in philosophic terms. Bloomfield believed that philosophers were mistaken in that they "forced their description into the scheme of Latin grammar" (1933, p.5), and in that they held Latin to be "the logically normal form of human speech" (1933, p.8). For the same reason, Bloomfield criticized the traditional grammarians whose doctrine was to define categories of the English language in philosophical terms. Bloomfield was also at dispute with them because they were convinced that "the grammarian can prescribe how people ought to speak," and thus they "ignore actual usage in favour of speculative notions"(1933, p.7). Moreover, Bloomfield attacked the mentalistic psychology because of its inability to capture the totality of meaning, and because of its inaccessibility to scientific investigation by available techniques. This position of Bloomfield about mentalistic psychology was

misinterpreted as if he ignored the importance of meaning in human use of language. (cf.Palmer, F.R., 1982 and 1996). Nevertheless, Bloomfield regarded considerations of meaning as essential. His critics regard meaning as existent somewhere outside of the individual speaker. However, they tried to make practical use of the concept LINGUISTIC MEANING. This concept is concerned with relations within language and with relations between language and the outside world as well. The relations within language are associated with the lexical item (word) and with a lexical structure whose study is known as lexical or structural semantics; the relations between language and the external world are concerned with the meaning of language in terms of the situations to which language refers or in which language occurs. The relations between language and the world were excluded by some studies such as generative grammar studies. Thus, generative grammar stated the semantic component entirely in terms of the relations within language (cf. Bacon, 1998; Allan, 1986; Frawley, 1992).

1. BLOOMFIELD'S VIEWS OF LINGUISTICS AND MEANING

1.1 Bloomfield's Views of Linguistics

Bloomfield regarded the methods of linguistics as those of natural sciences. To support this view, he contrasted the mentalistic theory and the mechanistic theory about human conduct, including speech: "The mentalist theory supposes that the variability of human conduct is due to the interference of some non-physical factors, spirit or will or mind (that) does not follow the patterns of succession (cause-and –effect sequences) of the material world; the mechanistic theory supposes that the variability of human conduct, including speech, is due only to the fact that the human body is a very complex system (1933, p.32f). Therefore, the linguist's findings should not be "distorted by any prepossessions about psychology. Mechanism is the necessary form of scientific discourse. In all sciences like linguistics, which observe some specific type of human activity, the worker must proceed exactly as if he held the materialist (mechanist) view" (ibid). Thus, Bloomfield understood and explained the variability of human conduct, including speech, as part of cause-and-effect sequences. It must be emphasized that he does not deny non-physical processes posited by mentalistic theories like thoughts, images, and feelings. Bloomfield acknowledged that we have such processes, but explained them as popular terms for bodily movements that the speaker alone is aware of, private experiences, or soundless movements of the vocal organs. Bloomfield explained this by arguing that the speech and the practical events depend on predisposing factors which consist of "the entire life history of the speaker and hearer"

(1933:20). According to Bloomfield, these predisposing factors contribute to the explanation of the linguistic facts, since similar situations may not only produce different linguistic responses but also similar linguistic responses may occur in quite different situations. Palmer (1981) criticized Bloomfield's predisposing factors and said that they are no more open to observation than the thoughts, images, and feelings of the mentalists. Therefore, talking about predisposing factors involves the same circularity of argument as talking about the concepts of thoughts, images, and feelings, etc.

1.2 Bloomfield's Views of Meaning

According to Bloomfield, the definition of the meaning of a linguistic form is possible "when this meaning has to do with some matter of which we possess scientific knowledge" (Bloomfield, cited in Palmer, 1981, p.58). As it was for Sapir (1921, p.59ff), the meaning for Bloomfield was also a weak point in linguistic theory. Bloomfield asked for the separation between the study of grammar and the study of meaning. He also argued in favour of defining grammatical categories wholly in terms of the form of the language, the actually observable features. Thus, formal features, not meaning, should be the starting point of linguistic discussion. Bloomfield's exclusion of meaning from grammar is because meaning is often very vague, and meaning categories are not easily shown by description, and because these categories can be often defined only in terms of the formal features of a language. Palmer argued that this view is exactly the same as talking about predisposing factors. That is to say, if the grammatical categories are given semantic definitions, the definitions are circular. As an example is the definition of a noun as 'a word used for naming anything'. The difficulty is that we do not have any way of establishing what 'anything' may be. Thus, the definition of the noun in terms of naming anything is totally circular. This circularity, Palmer argues, arises because we have no non-linguistic way of defining 'things' (cf.palmer, 1981).

Once again, Bloomfield argues for the exclusion of meaning from grammar; he points out that even when we can establish semantic and grammatical categories independently, they often do not coincide. He gives as an example the use of English tense which is not directly related to time since the past tense is used for future time in examples like 'if he came tomorrow …'.From this example, it becomes clear that the basic grammatical categories of a language must be established independently of their meaning. And defining meaning in terms of the context of situation means that the scope of meaning will be infinite. Bloomfield was fully aware of this problem, which made him despair of any satisfactory treatment of meaning. Palmer sees that the problem of the study of meaning can be evaded by confining the study of language to 'tight' lexical relationships of the kind seen in 'unmarried / bachelor' or 'short/ long', and confessed that

this kind of study will provide a very narrow semantic theory that can hardly be said to deal properly with meaning (cf.palmer,1981, p.48).

Like Bloomfield, Firth (1957a) believed that the description of a language could not be complete without some reference to the context of situation in which language is used. But Bloomfield's description goes much further than Firth, who made statements of meaning in terms of the situation. Bloomfield defined meaning as the situation. For Bloomfield, meaning consists in the relation between speech and the practical events that precede and follow it. A linguistic form is "the situation in which the speaker utters it and the response it calls forth in the hearer"(1933, p.20). This shows that the meaning of a linguistic form is "equivalent to the sum total of all human knowledge, (since) the situations which prompt people to utter speech include every object and happening in their universe" (1933, p.74). Thus, defining the meaning of every speech form in the language requires us to have "a scientifically accurate knowledge of everything in the speaker's world" (1933, p.139). Accordingly, the meaning of language can be defined only "if some science other than linguistics furnished us with definitions of the meanings, the meaning of the utterance (would) be fully analysed and defined, (if not), the statement of meanings is the weak point in language study, and will remain so until human knowledge advances far beyond its present state" (1933, p.140).

So far, it is obvious that Bloomfield suggests to narrow the scope of linguistics until the sciences can determine meanings and deliver them in strictly compiled forms. In the meantime, Bloomfield says, we can "act as though science had progressed far enough to identify all the situations and responses that make up the meaning of speech forms" (1933, p.77). Bloomfield, too, acknowledges that meaning "includes many things that have not been mastered by science" (1933, p.75). So long as science has no way of defining most meanings and demonstrating their constancy, Bloomfield says, "we have to take the specific and subtle character of language as a presupposition of linguistic study, just as we presuppose it in our everyday dealings…We may state this presupposition as the fundamental assumption of linguistics: in certain communities,some speech utterances are alike as to form and meaning. Each linguistic form has a constant and specific meaning. If the forms are different, we suppose that their meanings are also different"(1933, p.145). Bloomfield confessed that this assumption is true only within limits, even though its general truth is presupposed not only in linguistic study, but also by all our actual use of language. Assuming that some sameness lends each form a constant meaning collides with the thesis of continual innovation (cf. de Beaugrande, 1991, 4.23, p.65).

Meanings show instability in more than one way. For example, dictionary meanings can be either normal (central) or marginal (transferred); Bloomfield acknowledged that "we understand a form in the normal meaning unless some feature of the practical situation forces us to look to a marginal meaning" (1933, p.149). This link of meaning to the situation assists Bloomfield's stipulation in that "when the linguist tries to state meanings, he safely ignores displaced speech, but does his best to register all cases of transferred meaning: The practical situation (means) narrowed meanings('car' for 'streetcar') and widened meanings ('fowl' for 'any bird'). Deviant meanings(are) not natural or inevitable, but specific to particular cultural traditions" (1933, p.150f). Thus, meanings are instable in the presence of connotations. This point was emphasized by Bloomfield: "connotative forms might be 'technical', 'learned', 'foreign', 'slang', 'improper' …The chief use of our dictionaries (is to) combat such personal deviation (whose) varieties are countless and indefinable and cannot be clearly distinguished from denotative meaning" (1933, p.152ff).

In spite of the problems the linguist confronted with when studying meaning, Bloomfield by no means denied its importance for the study of language: "to study language (is) to study (the) coordination of sounds with meaning. In human speech, different sounds have different meanings. Linguistics (is made) of two main investigations: phonetics, in which we studied the speech-event without reference to its meaning; and semantics, in which we studied the relation of the event to the features of meaning" (1933, p.27, 74). Bloomfield was in doubt about the workability of such a scheme in practice, since our knowledge of the external world is so imperfect "that we can rarely make accurate statements about the meaning of a speech-form" (1933, p.74). For Bloomfield, there is another reason for the not workability of his scheme, purely phonetic observation cannot recognize the difference between distinctive and non-distinctive features of a language; this can be done only when we know the meaning. To escape this problem, Bloomfield suggested that we have to trust our everyday knowledge to tell us whether speech-forms are the same or different (cf. de Beaugrande, 1991, 4.26, p.65f). Bloomfield possibly refers here the issue to the "distinctive features which are common to all the situations that call forth the utterance of the linguistic form. Hearing several utterances of some one linguistic form, we assume (that) the situations of the several speakers contain some common features" (1933, p.141,158).

Though Bloomfield's model is essentially causal, he accepts Saussure's ideas that "the connection between linguistic forms and their meanings is wholly arbitrary"(1933, p.145).

CONCLUSION

The present study has shown that Bloomfield's mechanistic approach should not be taken as if he gave a simple view of language, since he acknowledges the fact

that " the human body (and) the mechanism which governs speech (are so) complex (that) we usually cannot predict whether a speaker will speak or what he will say" (1933, p.31). It has also shown that the study of meaning is not a clearly defined level of linguistics. Rather it is a set of studies of the use of language in relation to many different aspects of experience, to linguistic and non-linguistic context, to participants in discourse, to their knowledge and experience, to the conditions under which a particular bit of language is appropriate. The study of meaning relates to the sum total of human knowledge, though it must be the task of the linguist to limit the field of his study and bring order to the apparent confusion and complexity. The complexity of the study of meaning is merely one aspect of the complexity of human language. What we can say about meaning will be imprecise and often controversial.

Bloomfield in all his concern about language appeals for a linguistics which can make us critical of verbal response habits, and the investigation of the languages of the world may provide the basis for a "sound knowledge of communal forms of human behaviour. It is only a prospect, but not hopelessly remote, that the study of language may help us toward the understanding and control of human events" (1933, p.509).

This study also makes it clear that there can be no single, simple approach to the study of meaning, because there are many aspects of meaning both within language and in the relation between language and the world. The complexity of meaning reflects the complexity of the use of human language (cf. Davis and Brendan, 2004).

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Immediate Constituent Analysis (ICA)

Definition of Immediate Constituent

 Immediate Constituent Analysis, in linguistics, known as IC analysis a system of grammatical analysis that divides sentences into successive layers, or constituents. It is a method of sentence analysis first introduced by the American linguist, Leonard Bloomfield, in his book 'Language' published in1933. It is a major fature of Bloomfeldian structural linguistics.

In IC analysis, a sentence is divided up into major divisions or immediate constituents, and these constituents are in turn divided into further immediate constituents, and these process continues until irreducible constituents are reached i.e. until each constituents consists of only a word or meaningful part of a word (a constituent is any word or construction that enters into some larger construction) . The end result of IC analysis is often presented in a visual diagrammatic forms that reveals the hierarchical immediate constituents structure of a sentence. For sentences whose structure is unusual, this diagramming may become excessively complex; in such cases verbal description is used.

Immediate Constituent Analysis is a technique in analysing units or constituents which form a language unit, i.e. word cluster, phrase unit, clause unit or sentence unit. Each language unit assumed as units consist of two or more constituents directly form the units.

For example : the boy is smart. This sentence can be divided into immediate constituents " the boy" and "is smart". These in turn can be analyzed into immediate constituents (the+boy) and (is+smart). Another example, "The old man ran away," the first division into immediate constituents would be between "the old man" and "ran away." The immediate constituents of "the old man" are "the" and "old man." At the next level "old man" is divided into "old" and "man.

Bloomfield does not give any special technique to detect immediate constituents, rather appeals to native speaker's intuition.

IC Analysis is an important metodological tool for syntactically analysis based on Structural Linguistics theory. By applying this analysis technique, a sentence must be analyzed into two immediate constituents. If one or two immediate constituents consist of construction, then those immediate constituents must be further analyzed into its immediate constituents until ultimate constituents is reached i.e single word.

Constituent

La Palombara (1976: 173) gave a definition of constituent as a syntactically unit combined with other syntactically unit to form a construction. Moreover, La Palombara

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mentioned that each constituent can be classified based on two criteria in relation with its arrangement of internal constituent itself. in relation with the grammatical function, as a unit in a bigger syntactically environment i.e. syntactically related with other constituent.

Other definition is given by Crystal (1980 : 83). He stated that constituent is a linguistically unit that is a component of a bigger construction. Kridalaksana (1982 : 91) also mentioned about constituent that is a language unit which is part of bigger units or part of construction. So, constituent is a part or component of a construction.

The Ultimate Constituents
Are the smallest meaningful units which any given construction can be broken down to, consisting of, a morpheme at the morphological level and a word at the syntactic level.

Purpose and advantage of Immediate Constituent
The purpose of analysing immediate constituent is to avoid multiple interpretation on a phrase, clause or sentence. Eventhough, IC analysis has some weakness, but this kind of analysis give enough advantage in understanding language units, benefits in avoiding ambiguity because of language units bound with its discourse context which can be understandable with those analysis.

There are some traditional tests which are used to indicate constituency : the ability to stand alone, the substitution test, and the movement test by using a tree diagram, bracketing, or underlining.

Definition of Tree Diagram
A tree diagram is a two dimensional diagram used in T.G; Grammar as a mean of displaying the paternal hierarchical structure of sentences. The root of the diagram is the top most point, consisting of the initial symbol S. From this point of mode, branches descend corresponding to the categories which are specified by the roles.

Graphic tool which systematically breaks down, and then maps out in increasing detail, all components or elements of a condition, phenomenon, process, or situation, at successive levels or stages. In case of a 'divergent tree,' it begins with a single entry that has one or more paths (branches) leading out from it, some or all of which subdivide into more branches. This process is repeated until all possibilities are exhausted.

The tree diagram is a visual description of each unit that consist of constituents hierarchically. A tree diagram is more informative if it labels the constituents as instances of particular units or classes of units.

Three sizes of unit have been distinguished: clause, phrase, and word. A further level would distinguished morphemes (turn, -ed, recent, -ly) as constituents of words. The terms for different phrase (noun phrase, adjective phrase, etc) obviously reflect the character of the words which are the main constituents of these units.

The relationship between IC Analysis and Tree Diagram
Phrase structure rules of the generative grammar are an amalgamation of the subject-predicate and parsing systems of the traditional grammars and the IC analysis of the structural grammar. They are framed to derive a `kernel' sentence (in the Syntactic Structures, Chomsky 1957), or `underlying (deep) strings (in the Aspects, Chomsky 1965). These rules define basic grammatical relations that function in the deep structure. They also make explicit

the domination of constituent over the other. In short, they make explicit the universal conditions that define `human language'.

The phrase structure of a sentence is generally represented by a tree diagram. This representation of the phrase structure of a sentence is known as its `phrase marker' or `P marker' for short. The points that are joined by the lines or branches are called `Nodes'. Each of the nodes, except those on the bottom line (which are the terminal nodes) is given a label that represents a grammatically definable constituent - N, V, NP, VP, etc. where one mode is higher than another and joined to it by branches, it is said to `Dominate' it, if it is placed immediately above it and joined by a single line, it `Immediately' dominates it. `Dominance' then shows how a larger constituent may consist of one or more constituents of a smaller kind. It is also important to note that the tree structure preserves the linear order of the constituents, just as plain IC analysis does. The first noun phrase precedes the verb phrase; the verb precedes the second noun phrase. The determiner precedes the noun. `Precedence' thus like `Dominance' is clearly shown in the tree diagram.

The Differences and Similarities between IC Analysis and Tree Diagram

The differences are labeled bracketing and phrase structure trees provide much more information than IC analysis.

IC analysis symbol like head(H), modifier(M), subject(S), predicate(P), Verb(V), Complement(C), but the Tree Diagram symbol like noun phrase (NP), verb phrase (VP), noun determinant (Det), Adjective Phrase (AP), pronoun (Pro), prepositional phrase (PP), etc. The IC analysis structure form likes box, but tree diagram structure like tree branches.

The similar is to analyze the sentences.

Tree Diagram Analysis

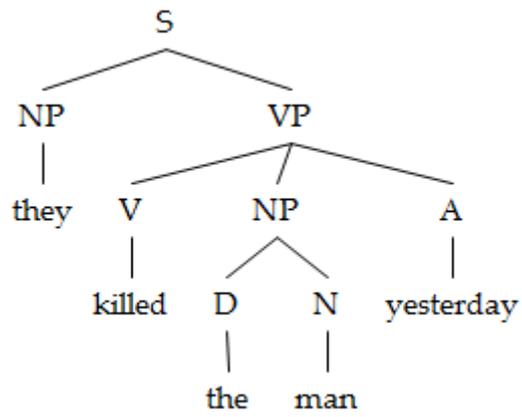The sentence "the dog bites the cat" will be represented by a tree diagram as

This can be done with the use of `phrase structure rules' (PS rules). The tree structure of the sentence given in the example can be generated by six rules.

1. S-----NP------VP
2. VP----V--------NP
3. NP----DET-----N
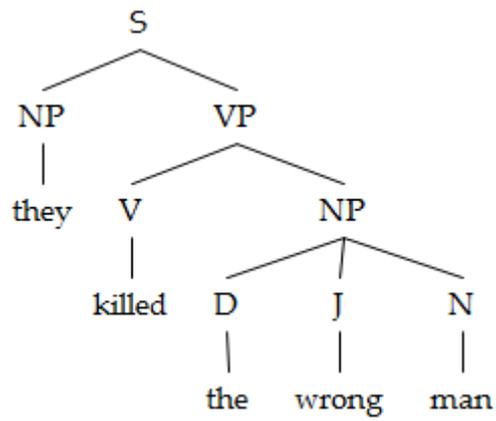4. V---------bites
5. DET-------the
6. N----------cat, dog

These rules will not generate only the one sentence handled in the tree diagram - `The dog bites the cat'. Since both `the" are shown as determiners and both `dog' and `cat' as nouns, the rules permit us to permute the determiners in each determiner position and the two nouns in each noun position and in fact, to generate no less than sixteen different sentences including.
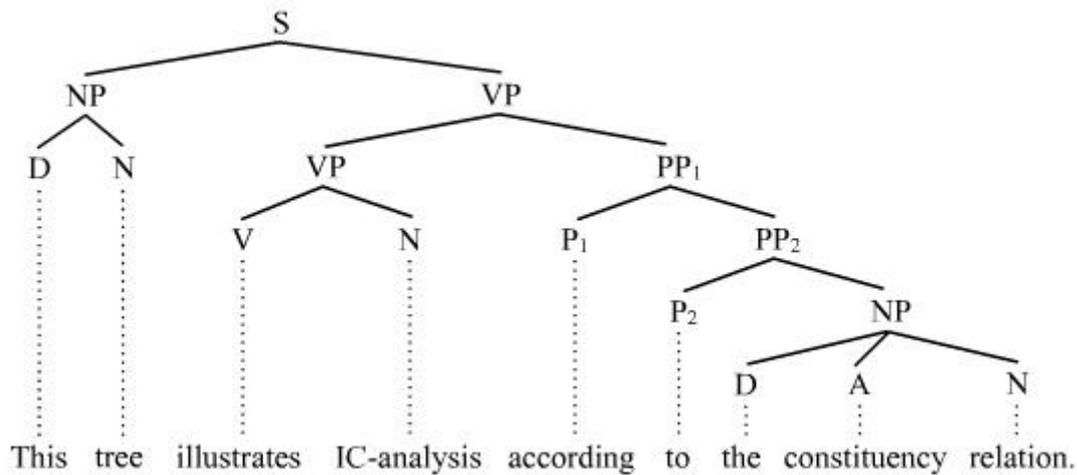
Examples of Tree Diagrams

The sentence: they killed the man yesterday

```
                    S
          ┌─────────┴─────────┐
         NP                   VP
          |          ┌────────┼──────────┐
        they    V         NP              A
                 |      ┌──┴──┐           |
              killed   D      N       yesterday
                       |      |
                      the    man
```

The sentence: they killed the wrong man

```
              S
        ┌─────┴─────┐
       NP           VP
        |       ┌────┴──────┐
      they   V              NP
              |      ┌───────┼────────┐
           killed   D        J         N
                    |        |         |
                   the     wrong      man
```

The sentence: this tree illustrates IC-analysis according to the constituency relation.

This tree illustrates the manner in which the entire sentence is divided first into the two immediate constituents 'this tree' and 'illustrates IC-analysis according to the constituency relation'; these two constituents are further divided into the immediate constituents 'this' and 'tree', and 'illustrates IC-analysis and according to the constituency relation'; and so on.

An important aspect of IC-analysis in phrase structure grammars is that each individual word is a constituent by definition. The process of IC-analysis always ends when the smallest constituents are reached, which are often words (although the analysis can also be extended into the words to acknowledge the manner in which words are structured).

The structuralists ignored meaning and emphasized that the language should be studied in a mechanical ways, and a linguist should therefore discover the various constituents of language as element in the larger construction which is called a sentence.

Limitations of IC Analysis

Immediate constituent analysis has its limitations:
a) One of the limitations of ICA is that it does not indicate the nature and grammatical functions of the constituents. To remove this inadequacy, the idea of labeling was introduced. These labels are of two types: class labels and function labels.
Class labels are: NP (noun phrase), VP(verb phrase), A(article), Adj (adjectives), etc.
Function labels are : S (subject), V (verb), O (object), etc.
b) It is not constituent analysis has its limitations. It is not possible to analyze like such structures, as they do not form proper grammatical groups. For example, hence is a sentence: She is taller than her sister.
In this sentence, the sequence –er than is not covered by IC analysis.
c) Ambiguous sentence cannot be analyzed adequately. Eg, time flies.
An overlapping also causes a problem for ICA. Eg, he has no interest in music.
d) An element remains unstated in sentences like 'hit the ball'
e)Unbalanced Bracketing: IC analysis does not refer to our grammatical knowledge. So it does not take us very far and without the help of labeled bracketing we cannot point out the source of ambiguity in many sentences. The labeled bracketing can be used to differentiate the two possibilities in an example that is often against IC analysis.

Flying planes can be dangerous. Here, in one case 'flying' is the head of the noun phrase while on the other hand is 'planes'.

f) Discontinuous elements:

Let's consider the following sentence:

They put off the meeting.

Let's apply ICA to analyze the sentence. We notice that ICA can apply the binary division to identify the constituents.

Any English speaker knows that he has a second possibility to form the above sentence like this: they put the meeting off.

Let's apply ICA; we notice that it stands hopeless to divide the predicate into two constituents.

In the case of phrasal verbs, we need a new approach to account for the discontinuity. The weakness of ICA is that it is not able to describe the discontinuity of phrasal verbs.

f) Complex sentences

We converse with simple and complex sentences; we know how to form and understand complex sentences. My grammar in return should be able to describe how complex sentences are formed.

ICA is famous by its 'upper unit' of the analysis which is 'the simple sentence' (NP+ VP+NP). Let's consider the following sentence:

The rat the cat the man chased killed ate the cheese. This sentence is grammatical; it is the production (result) of the use of 'the embedding process'. It is hard to produce and understand, but it is a sentence which is possible in the language we can predict it. So, my grammar should be able to describe sentences we produce and sentences which are possible but not produced.

Ambiguous sentences (Ambiguity)

It is the one which has more than one meaning. Since ICA is formal analysis (stops at form), it cannot talk about ambiguous sentences for the sake of systematicness (to keep on the same line of the basic principles and never deviate).

Let's consider the following example:

The man met the lady with flowers.

ICA cannot explain the second meaning because it stops at the meaning of the given structure. One structure, one meaning. So, the description given by ICA is incomplete.

Examples of ambiguity

-Sarah gave a bath to her dog wearing a pink t-shirt.

Ambiguity: is the dog wearing the pink t-shirt?

-I have never tasted a cake quite like that one before!

Ambiguity: was the cake good or bad?

- Did you see her dress?

Ambiguity: is she getting dressed or are they talking about her clothes?

-I rode a black horse in red pajamas; this sentence is ambiguous because it may lead us to think that the horse was wearing red pajamas. It becomes clear when it is restructured" wearing red pajamas, I rode a black horse".

-john went to the bank.

Ambiguity: in this sentence we confuse one meaning of "bank" which is a building, to another meaning, being "an edge of a river". Context usually resolves any ambiguity in such cases.

-You should bring bread or juice and dessert. (This sentence could mean that you must bring just bread, bread and dessert, or juice and dessert).

-Harry isn't coming to the party. Tell Joe that we'll see him next week. (The "him" could refer either to Harry or to Joe).

Let's take this example of ambiguity:

Let's take a closer look at the ambiguity in the phrase: *I shot an elephant in my*

While hunting in Africa, I shot an elephant in my pajamas. How he got into my pajamas, I don't know.

Let's take a closer look at the ambiguity in the phrase: I shot an elephant in my pajamas. First we need to define a simple grammar:

S   NP VP

PP   P   NP

NP   Det N / Det N PP/ 'I'

VP   V   NP/ VP PP

Det   an/ my

N   elephant/ pyjamas
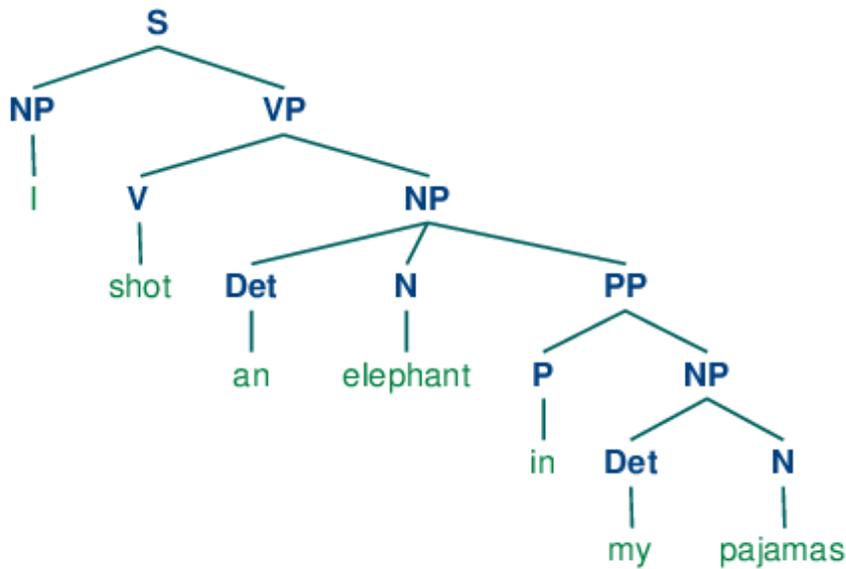
V   shot

P   in

This grammar permits the sentence to be analyzed in two ways, depending on whether the prepositional phrase 'in my pyjamas' describes the elephant or the shooting event.

The program produces two bracketed structures, which we can depict as trees, as it follows:

b.

S
NP   VP
I
V   NP
shot   Det   N   PP
an   elephant   P   NP
in   Det   N
my   pajamas
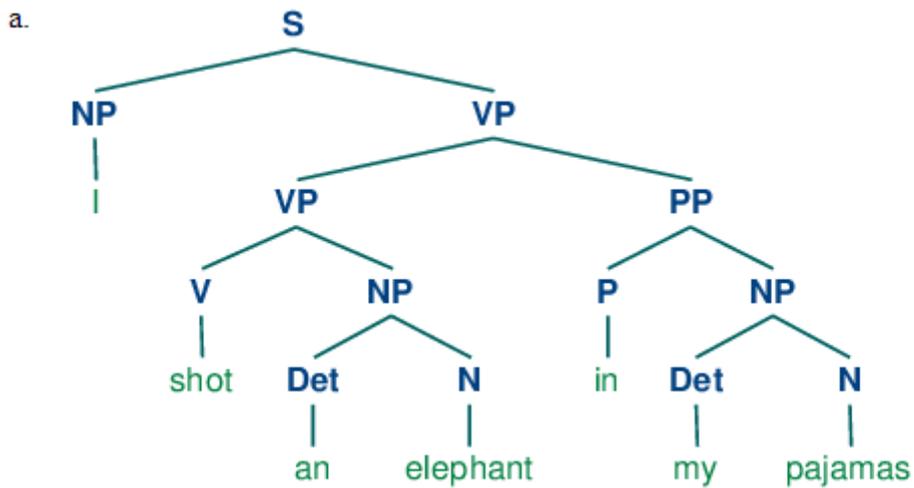
Notice that there's no ambiguity concerning the meaning of any of the words; e.g. the word *shot* doesn't refer to the act of using a gun in the first sentence, and using a camera in the second sentence.

If we parse the sentence *The dog saw a man in the park* using the grammar shown before we end up with two trees, similar to those we saw above:

a.

S
NP   VP
Det   N   V   NP   PP
the   dog   saw   Det   N   P   NP
a   man   in   Det   N
the   park
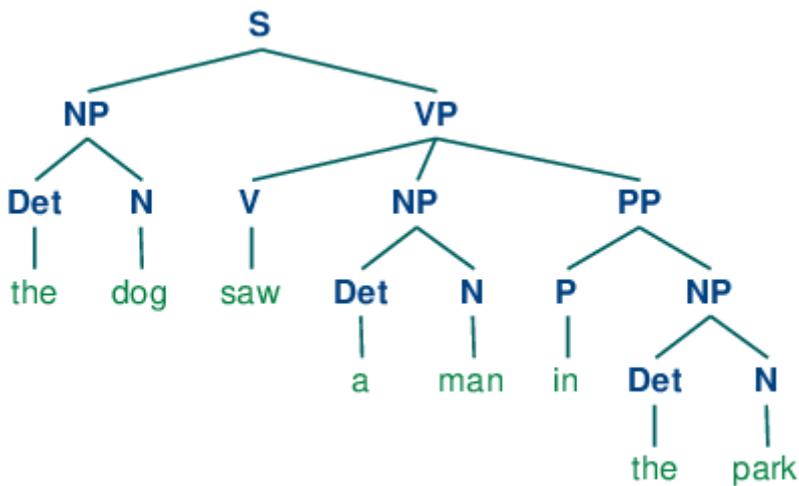
b.
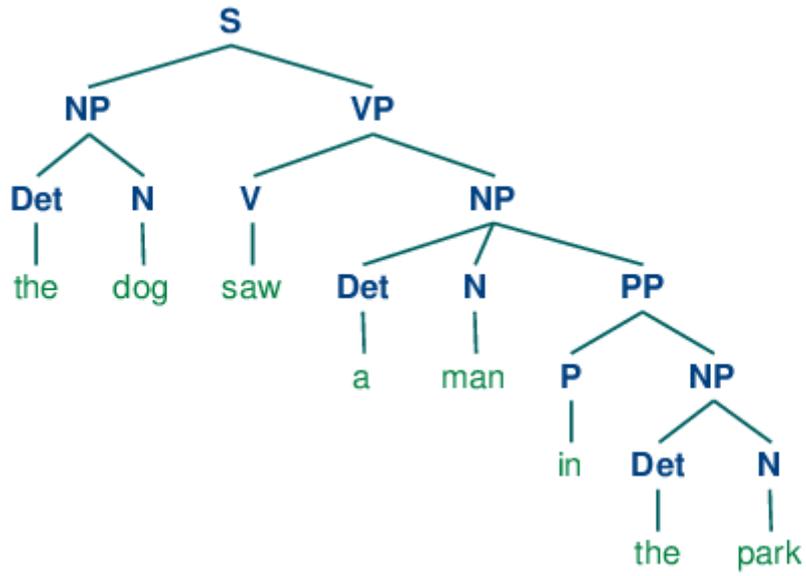
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Transformational Generative Grammar

Noam Chomsky

 Avram Noam Chomsky was born on December 7, 1928. He is an American linguist, philosopher, cognitive scientist, historian, social critic, and political activist.

Sometimes described as "the father of modern linguistics," Chomsky is also a major figure in analytic philosophy and one of the founders of the field of <u>cognitive science</u>. He holds a joint appointment as Institute Professor Emeritus at the Massachusetts Institute of Technology (MIT) and laureate professor at the University of Arizona, and is the author of over 100 books on topics such as linguistics, war, politics, and mass media. Ideologically, he aligns with anarcho-syndicalism and libertarian socialism.

   Born to middle-class Ashkenazi Jewish immigrants in Philadelphia, Chomsky developed an early interest in anarchism from alternative bookstores in New York City. He began studying at the University of Pennsylvania at age 16, taking courses in linguistics, mathematics, and philosophy. From 1951 to 1955, he was appointed to Harvard University's Society of Fellows. While at Harvard, he developed the theory of transformational grammar; for this, he was awarded his doctorate in 1955. Chomsky began teaching at MIT in 1957 and emerged as a significant figure in the field of linguistics for his landmark work *Syntactic Structures*, which remodeled the scientific study of language. From 1958 to 1959, he was a National Science Foundation fellow at the Institute for Advanced Study. Chomsky is credited as the creator or co-creator of the <u>universal grammar</u> theory, the <u>generative grammar</u> theory, the <u>Chomsky hierarchy</u>, and the minimalist program. Chomsky also played a pivotal role in the decline of <u>behaviorism</u>, being particularly critical of the work of <u>B. F. Skinner</u>.

One of the most cited scholars in history, Chomsky has influenced a broad array of academic fields. He is widely recognized as a paradigm shifter who helped spark a major revolution in the human sciences, contributing to the development of a new <u>cognitivistic</u> framework for the study of <u>language</u> and the <u>mind</u>.

Transformational Generative Grammar

   Transformational Generative Grammar is a device for generating sentences in a language. It generates only the well-formed or grammatically correct sentences of a language since it is meant **to create the rules and principles** which are in the mind or brain of the native speaker.

Noam Chomsky believed that grammar has **recursive rules** allowing one to generate grammatically correct sentences over and over. Our brain has a mechanism which can create language by following the language principles and grammar.

Transformational Process of the Syntactic Structures according to Chomsky's Transformational Grammar can be best summarized by **adding**, **deleting**, **moving**, and **substituting of words.** These changes take place through specific rules, which are called **Transformational Rules**.

Recursion or Recursive Rules

Recursion is the capacity to be applied more than once in generating a structure. e.g., "He is the man who caught the thief who stole the jewelry that I bought yesterday". In this example relative clause is used more than once to create a long sentence. It means that we can create long sentences by Recursion rule. The same rule can be applied again and again to create more and more sentences.

NP + VP—NP + VP

Ahmed thought   Ali helped him

Generally, any sentence structure contains a **noun phrase** (NP) and a **verb phrase** (VP).

In the sentence:

'Vicki laughed'

'Vicki' is an NP and 'laughed' is a VP.

The sentence could change to:

'The woman laughed'

'The woman' is the NP and 'laughed 'is the VP.

You can extend the sentence to:

'Vicki who lives near me laughed'

'Vicki who lives near me' is the NP, and 'laughed' is the VP.

Expanding the sentence,

'Vicki who lives near me laughed loudly'

The NP consists of 'Vicki who lives near me' and the VP is 'laughed loudly'.

Literally transformation means "to change the form of something." Here we write a sentence then we change its form by moving, adding, deleting some words but the actual meanings remains the same. e.g.,

i) I met my friend yesterday.

ii) Yesterday I met my friend.

In the first sentence the adverb is in the last place and in the second sentence the adverb is in the first place but the meanings of both of the sentences are the same just it has been transformed into another structure. Let's take another example.

iii) He is ridiculing his friend.

To make this sentence interrogative we transform the position or shape of the sentence by moving the auxiliary verb.

iv) Is he ridiculing his friend?

This shows that by transformation we can produce many sentences by keeping in view one sentence.

Deep Structure and Surface Structure

Transformational grammar, also called Transformational-generative Grammar, a system of language analysis that recognizes the relationship among the various elements of a sentence and among the possible sentences of a language and uses processes or rules (some of which are called transformations) to express these relationships. For example, transformational grammar relates the active sentence "John read the book" with its corresponding passive, "The book was read by John." The statement "George saw Mary" is related to the corresponding questions, "Whom [or who] did George see?" and "Who saw Mary?" Although sets such as these active and passive sentences appear to be very different on the surface (*i.e.,* in such things as word order), a transformational grammar tries to show that in the "underlying structure" (*i.e.,* in their deeper relations to one another), the sentences are very similar. Transformational grammar assigns a "**deep structure**" and a "**surface structure**" to show the relationship of such sentences. Thus, "I know a man who flies planes" can be considered the surface form of a deep structure approximately like "I know a man. The man flies airplanes." The notion of deep structure can be especially helpful in explaining ambiguous utterances; *e.g.,* "Flying airplanes can be dangerous" may have a deep structure, or meaning, like "Airplanes can be dangerous when they fly" or "To fly airplanes can be dangerous."

Let's take another example to understand the difference between deep and surface structures.

I) I ate a banana.

ii) A banana was eaten by me.

In this example

i) is the active voice and **ii)** is passive voice.

Structures of the sentences are different but the meanings are the same. In the above example there are two surface structures but one deep structure or underlying meaning. It means that a sentence can have two or many surface structures but one deep structure. Now take another example; "The lady beat a man with an umbrella."What we read is the surface structure of this sentence, but when we ponder on its meaning we feel ambiguity in getting it s meaning. Whether it means that the lady is having an umbrella and she is beating the man with it or that the lady is beating the man who is having an umbrella. This ambiguity leads to two different meanings of one sentence. It means that a sentence can have one surface structure but more deep structures.