Term Paper

Introduction To Linguistics – 1 CL1.101.M21

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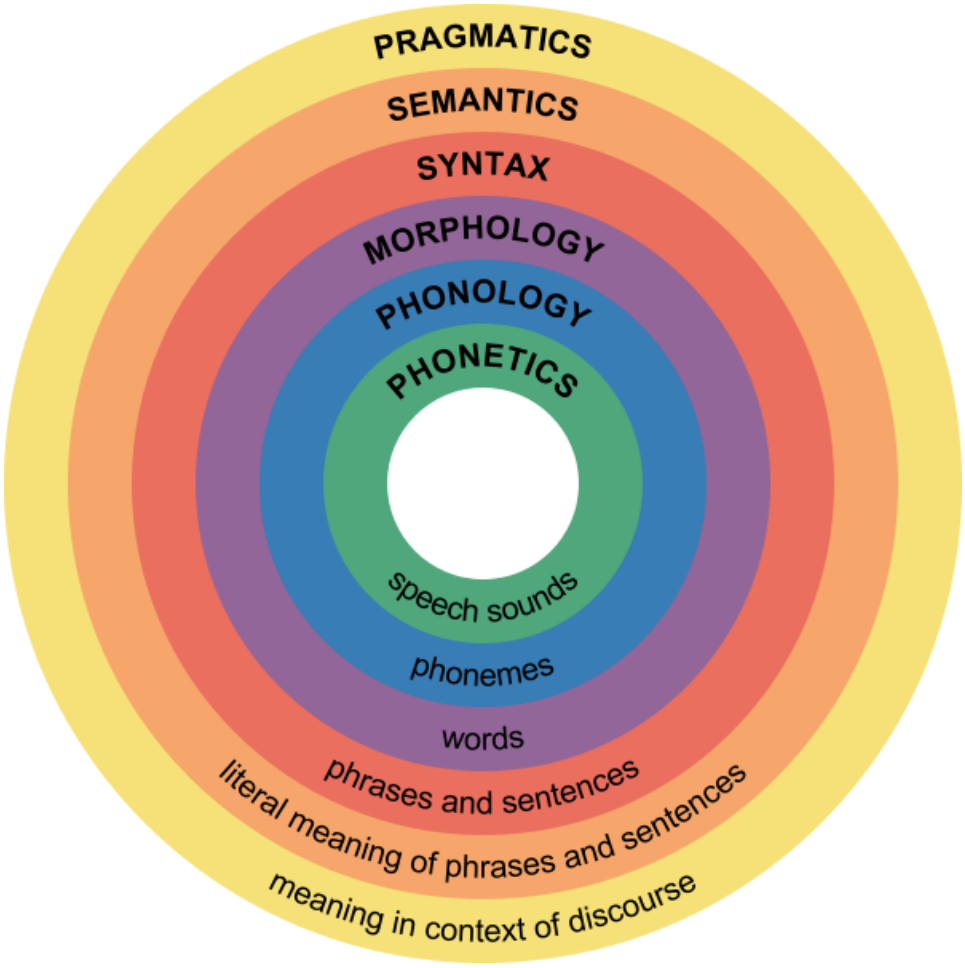
Term Paper Topic: What do you understand by "structure dependence"? Explain with reference to different aspects of language -- (sound, word, sentence) -- with suitable examples from Indian languages.

With reference to the topic itself, I would like to start this term paper from the quote of a great linguist Noam Chomsky which said: "The structure of a language determines not only the thought but reality itself" When faced with the question, " what do you understand by "structure dependence"? I realised this could not be a one-sentence answer and also require me to go into depts of every single aspect of language and relate them properly with our subject to come to a conclusion. Let's then start with the very start of humans, that is children or also known as a newborn babies, Noam Chomsky (1968) developed a theory that proposes that the human brain is innately wired to learn the language, a theory known as nativism. He believes that children could not learn something as complex as human language as quickly as they do unless there is already a grammatical structure for language hardwired in their brains before they ever hear human language. Structure-dependency could not be acquired by children from hearing sentences of the language; rather, it imposes itself on whatever language they encounter, just as in a sense the pitch range of the human ear restricts the sounds we can hear. Children do not have to learn these principles but apply them to any language they hear.

All speakers know structure-dependency without having given it a moment's thought; they automatically reject "*kya billi wo kaali hai ?"* even if they have never encountered its like before. How do they have this instant response? They would accept many sentences that they have never previously encountered, so it is not just that they have never heard it before. Nor is structure-dependency transparent from the normal language they have encountered. Structure-dependency is, then, a principle of language knowledge built-in to the human mind. It becomes part of any language that is learned, not just of English. Principles and parameters theory claims that an important component of the speaker's knowledge of any language such as English is made up of a handful of general language principles such as structure-dependency.

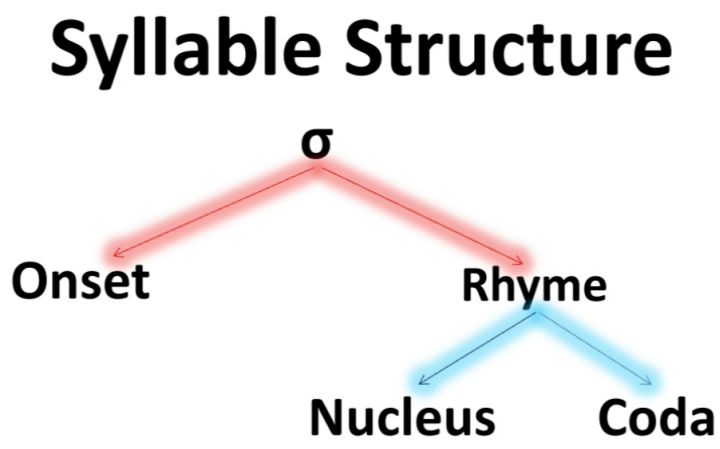
Well, then what is structural dependence or structure-dependency, in general words we can define it as the linguistic principle that grammatical processes function primarily on structures in sentences, not on single words or sequences of words.

To get a better idea of what is structural dependence, let us grow up the hierarchy from the very basics of phonology and slowly move into complex structures of syntax, semantics and above.



Linguistics defines the levels of structure based on analysis across and within the languages . As shown in the figure, the major levels of a structure applicable here are phonological, morphological, syntactic, and pragmatic level.

Phonology deals with sound structure in individual languages: the way distinctions in sound are used to differentiate linguistic items, and the ways in which the sound structure of the 'same' element varies as a function of the other sounds in its context. Phonology and phonetics both involve sound in natural language, but differ in that phonetics deals with sounds from a language-independent point of view, while phonology studies the ways in which they are distributed and deployed within particular languages.



The major structure for the organisation of sounds is the *syllable* it's a unit of pronunciation having one vowel sound, with or without surrounding consonants, forming the whole or a part of a word; for example, there are two syllables in *water* and three in *inferno*. It consists of an *onset* (beginning), a *rhyme* (everything after the beginning) which can be sub-divided into a *nucleus* (vowel or vowel-like centre) and a *coda* (right-edge).

For example :

Chaplus - cha + plus

bIstra - bIs + tra

Siski - sis + ki

dostana - dos + ta + na

Talking about sounds or phonemes or also known as the very very basics and fundamentals of any language we can see that the structure of phonemes vary from language to language. For example in Hindi we have different syllables for [p] and [ph] but this is not found in English.

And not only in Hindi but generally Indian languages are very rich in phonemes as compared to their western counterparts.

Western languages	Indian languages
Eng - 5 vowels and 21 consonants	Telugu - 18 vowels and 35 consonants
French - 6 vowels and 20 consonants	Hindi - 12 vowels and 41 consonants
Hawaiian - 5 vowels and 8 consonants	Tamil - 12 vowels and 18 consonants
Spanish - 5 vowels and 22 consonants	Sanskrit - 16 vowels and 34 consonants

By referring to the above data we can say that Indian languages, in general, have a greater amount of vowels and consonants then western counterparts.

By combining particular sounds we can form meaningful words, but do every combination of phonemes turn out to be a meaningful word? No, there are only a set combination of

phonemes that can be used to generate meaningful words, although they are not a lot of universals that guide the making of a word however we can spot two to three in some particular languages for examples mostly each and every word of Telugu language ends in vowels, and also in English where we refrain from producing two vowels consecutively by adding an article **a** or **an** inbetween where **an** will break the flow of vowels if there is vowel present int he starting of the next word

We can also spot that in western languages, a particular alphabet is producing different types of sounds in different circumstances for example the vowel /a/ in c**a**t, digit**a**l, w**a**ter where its producing [æ], [ɐ] and [ɵ] sounds respectively whereas in Indian languages, due to the diverse phonological structure we don't get to see cases of these types.

Now as we have an idea upon phonological structural dependency lets move to the complex form of words where we can highlight basic structural rules and deeply understand how we can combine two or more words in a specific logical combination to churn out words that may have changed tenses, change of plurality , change of gender or even it can be complete change of meanings, Lets move to morphology.

What is morphology ? For the first time in 1859,the German linguist **August Schleicher** coined the word morphology , it is the study of words, how they are formed, and their relationship to other words in the same language. It analyzes the structure of words and parts of words such as stems, root words, prefixes, and suffixes. However its history dates back hundreds of years to the ancient **Indian linguist Pāṇini,** who formulated the 3,959 rules of Sanskrit morphology in the text *Aṣṭādhyāyī* by using a constituency grammar.

Lets start our study of morphology from the very word itself, " morphology" contains two morphemes morph + logy or also can be written as morpheme + logy where this word means "branch of knowledge" so the meaning of morphology is "the branch of knowledge concerning (words) forms" diving into the subject we can divide morphemes into two types, first will be the free morphemes which defines as the name suggests that they are free or they can be standalone words for example in hindi the words are *pyaar , dost , jald , kaam , uchit* or in sanskrit they can be *adhikh , teevra* etc . and the other kind of morphemes are known as bound morphemes for example in hindi *-i , -a , an- , par-* and in sanskrit they can be *-tar, -tam* etc. They may attach at the beginning(prefixes) , the end(suffixes), in the middle (infixes), or both in the beginning and the end of the word (circumfixes)

Some examples are given below which shows the usage of the above mentioned morphemes

Prefixes and Suffixes :

Many languages have prefixes and suffixes,but languages may differ in how they deploy these morphemes for example in hindi and sanskrit

Pyaar (love) – – – – – – – pyaar**a** (adv) sukh (happy) – – – – – – – – – sukh**i** (adv)

Uchit (jutifiable) –**an**uchit (unjustifiable) kaam(work) – – – – – – – – – – **na**kaam

Adhikh– – – – – – – >Adithk**ar** — – – – – > adhit**am**

Also in Tamil for example :
Pen (girl) – – – pen**nin** (woman)

Now that we have knowledge about affixes, when an affix is added to a root morpheme ,it forms a stem and a stem can be added to more stems to make more complex meaningful words. For example :

Root - safal
Stem - safal + ta
Stem - a + safal + ta

Root - chara
Stem - be + chara

Bound morphemes such as *-i , -a , an- , par-* are *derivational morphemes*. When they are added to the base , a new word with a new meaning is generated and derived words can also have changed grammatical class than of the original word, example the adddition of *-na* suffix to a noun can change it to a verb but in the context of Indian languages we cannot directly come to the conclusion that addition of and X morpheme to a root word will change it to a particular grammatical form from another because there are many more rules which are to be considered.

For example :
lets consider the addition of suffix ***-ak***

Verb to noun	**adjective to adjective**	**noun to noun**
Terna - tera**ak** Chalna - chal**ak**	samarth - samarth**ak**	bandh - bandh**ak**

lets consider the addition of prefix ***a-***

Adjectives to adverb	**Adjective to adjective**	**Noun to noun**
* Uchit - **a**nuchit	Parichit - **a**parichit Safal – **a**safal Parichit - **a**parichit	Sabhyata – **a**sabhyata

** we are observing quite a beautiful phenomenon which is happening in the example "Uchit - **a**uchit" where the prefix is "a-" and we can observe that there is an added "n" over there, this is because of the fact that both "a" and "u" (first alphabet of the root word) are vowels and if we try to pronounce it without "n" it is quite hard to pronounce both the vowels consecutively without breaking the flow of word ,so this is the reason why we have added a consonant there in between both the vowels to keep the flow of pronunciation of the word smooth.*

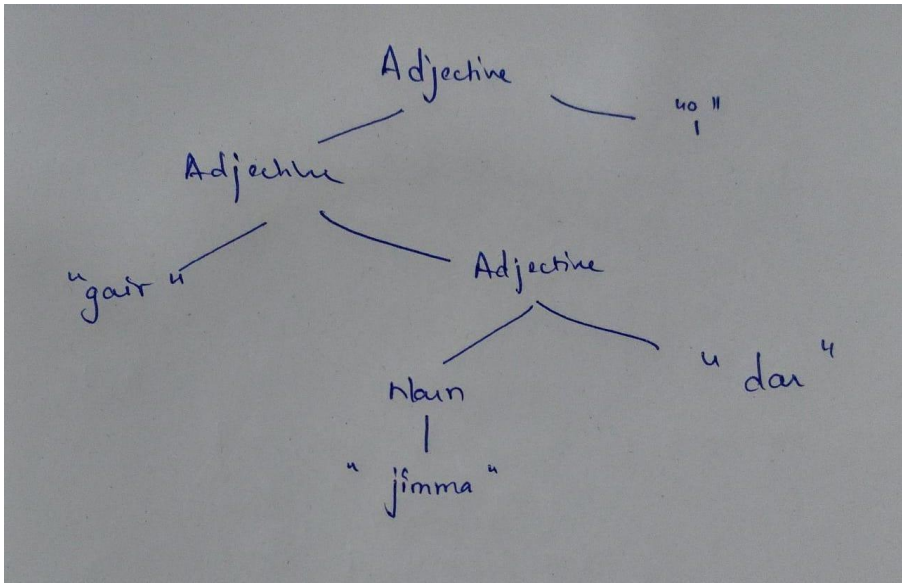
Now lets move to those morphemes which when added to the words does not changes the grammatical category of their stem word. They mark properties such as tense, number , person and so forth. Such bound morphemes are called inflectional morphemes. For example in hindi we can find inflectional morphemes such as

Hindi	**Inflectional morphemes**
-i	female + singular
-a	male + singular
-ungi	female + future + singular
-unga	male + future + singular
-iye	plural
-enge	plural + future
-diya	first person + future

We saw earlier that morphemes are added in fixed order. This order represents the hierarchical structure of the word. This tree basically shows us how the main word is formed from the root word by also keeping in mind the internal structure of the word and rules of formation.

For example :

(lauhpathagāminīsūchakdarshkaharitatāmralauhpaṭṭikā) = loha + path + gamini + suchak + darshak + hari + tamralu + pattika



2. Gairjimmedari = gair + jimma + dar + i

Now we have a pretty clear idea upon how complex words are formed ahdering to the structural dependency of the formation of words

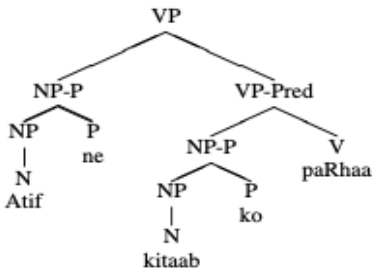
and now we should move on to syntax where the syntactic level of structure concerns the structure of sentence, i.e., the categories of words and the order in which they are assembled to form a grammatical sentence.

All the languages in the world are governed by some rules which are known as grammar, these few set of rules in the mind of the speaker will enable us to produce and understand potentially infinite number of sentences. Any sentence which does not adhere to those grammatical rules are judged ungrammatical for example, "*khaliya khana maine"*. And most importantly the part of grammar that represents a speaker's knowledge and their structures is called syntax . does that means that every grammatically correct sentence will have a meaning? No, and this phenomenon was described by a very famous sentence "Colorless green ideas sleep furiously" which chomsky offered as an example to grammatical correct sentence which has no meaning.

The ability to produce, understand, and judge the grammaticality of a sentence depends on whether it conforms to the unconscious rules of our mental grammar. This grammar is different from the prescriptive grammar rules that we are taught in school. We develop the mental rules of grammar long before we attend school(unconcious rules),and this is what was actually said by chomsky in his book "Syntactic Structures." where he proposed a novel idea: that All human beings may be born with an innate understanding of how language works or basically we can acquire language because we are genetically encoded with a universal grammar , a basic understanding of how communication is structured.

Looking at the sentence structure we can write the string of words in two forms,

Atif ne kitaab ko paRh-aa
(flat form)

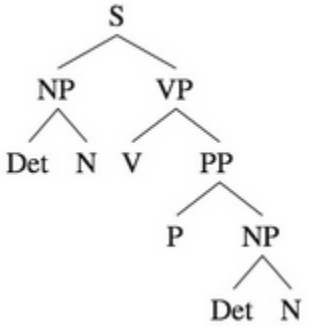


(branched form)

We began our discussion with a simple sentence *"Atif ne kitaab ko paRh-aa"* but now we can see that this simple sentence can have such a complex structure. Now the first question which comes into the mind is that how are we able to break down sentences or what rules are we following ? so, we can apply a set of rules to determines these for example : stand alone test , replacement by a pronoun or also an observation that these move along as an unit.

We can also find "structural ambiguities", which in short means that those sentences which may have two or more meanings for example, "*ladki railgaadi mai bethe hue ladke ko chalte hue dekh rahi hai"* now this sentence can have a lot of meanings for example it may mean that the girl is watching a boy walking inside the train or this could also mean that the girl is watching the boy in

the train while she is walking. Now this confusion can be easily solved by breaking the sentence into its constituents.



Talking about the syntactic structure, there are two different approach to describe it , namely the dependency structure and the phrase structure.

Dependency structure - Dependency grammar (DG) is a class of modern grammatical theories that are all based on the dependency relation (as opposed to the *constituency relation* of phrase structure) Dependency is the notion that linguistic units, e.g. words, are connected to each other by directed links.

Phrase structure - In linguistics, phrase structure grammars are all those grammars that are based on the constituency relation, as opposed to the dependency relation associated with dependency grammars; hence, phrase structure grammars are also known as constituency grammars.

The syntactic categories (a group of expressions which can be substituted without the loss of grammaticality) we talked about can be further divided into NP ,VP, PP etc. syntactic categories include both, phrasal categories as well as lexical categories which are briefly described below

Phrasal categories

Noun Phrase (NP)
Verb Phrase (VP)

Adjective Phrase (AP)
Prepositional Phrase (PP)
Adverbial Phrase (AdvP)

Lexical categories

Noun (N)
Verb (V)
Preposition (P)
Adjective (A)
Adverb (Adv)

Looking at the structural diversity ,we humans are spread all across the world over millions of kilometers and as and when we travel through the distance we see that language starts showing variations, sometimes the whole language might get changed. In india the communication style can change within just 12-15 kms. And do all of these languages have the same structure? No, linguists have often found difficulty in studying the diversity of

languages, let alone the potential diversity of languages gone extinct, but due to their decades of hardwork we now have a few syctactic categories based on the grammatical feature of the languages, for eg. SOV, SVO ,VSO ,VOS ,NODOM ,OVS and OSV.

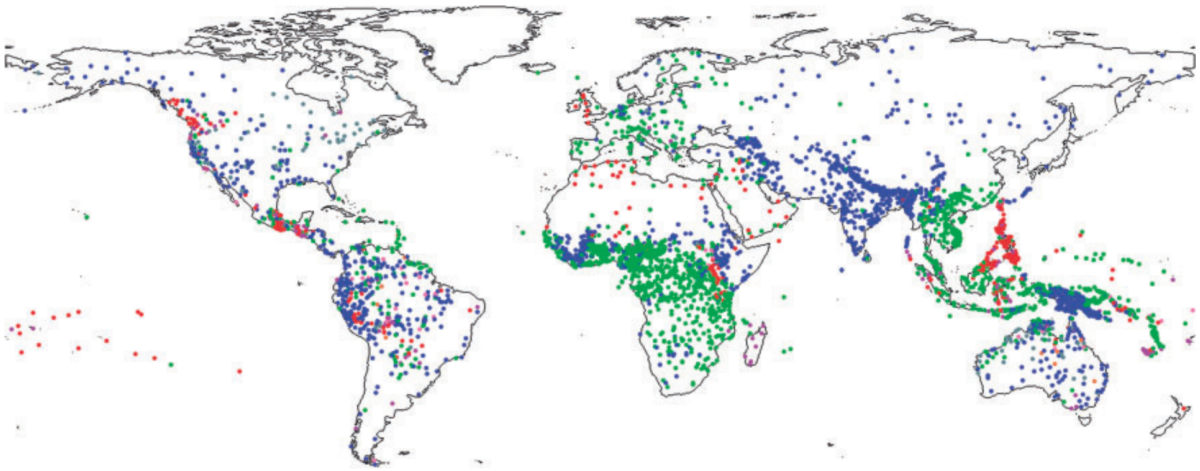


Figure 2. Geographical distribution of basic constituent orders in languages across the world, adapted from Hammarström (2013). Legend: SOV blue, SVO green, VSO red, VOS purple, NODOM gray, OVS yellow, OSV orange. (Colour online)

As we can see in this picture normally all the Indo-Aryan languages are SOV ordered where as the european languages are SVO ordered.for example

English - Alex is eating food.

(subject) (verb) (object)

Hindi - alex khana kha rha hai

(subject) (object) (verb)

Filipino - kumakain si alex ng pagkain

(verb) (subject) (object)

Malagasy - mihinana sakafo i alex

(verb) (object) (subject)

If we talk about Indian languages then in Hindi the sentences are divided into *saral(simple)* , *sanyukth (compound sentences) and mishrit (complex sentences)* with reference to the complexity of the sentences.For example

सरल वाक्य – सूरज पढ़-लिखकर अधिकारी बना।

सरल वाक्य – सूरज के निकलते ही फूल खिल उठे |

संयुक्त वाक्य – सूरज पढ़ा-लिखा और अधिकारी बना।

संयुक्त वाक्य – सूरज निकला और फूल खिल उठे।

मिश्र वाक्य – जैसे ही सूरज पढ़-लिख गया, वह अधिकारी बन गया।

After we have gone through the all the concepts regarding the structural dependency starting from the phonology, the syllables then the structural dependency upon words which were explained using morphology and then finally the structural dependency of sentences, we are now sufficient to draw upto some conclusions

We can conclude that languages are not chaotic or made up of facts, but languages are beautifully carved with logically reasonings. Right from the very fundamental of language the sounds or phonemes they are well defined in their structures upto the very complex sentences. We can also conclude to the idealogy that these complex structures are present in our subconscious brains and not taught to us in any school, even after listening to a completely new sentence we can easily point out its grammatical faults. We can say that language is completely based upon certain set of rules and if they are not followed at some or the other point the whole sentence could be stated as grammatically incorrect or absurd. Languages change with distance and so do their structures, we cannot say that each and every language on earth will follow a fixed set of structures, each and every language may have its own structure and own set of rules .

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References :

1. https://www.thoughtco.com/structure-dependency-grammar-1691997
2. https://www.sagepub.com/sites/default/files/upm-binaries/57593_Chapter_9_Levine_Sample.pdf
3. https://ils.unc.edu/courses/2017_fall/inls641_001/books/RD_Agenda_VisualAnalytics.pdf
4. https://commons.wikimedia.org/wiki/File:Major_levels_of_linguistic_structure.svg
5. https://www.sciencedirect.com/topics/neuroscience/phonology
6. https://linguistics.stackexchange.com/questions/11586/syntax-and-linguistics/11590#11590
7. https://en.wikipedia.org/wiki/Morphology_(linguistics)
8. (Victoria Fromkins||Robert Rodman||Nina Hyams) an introduction to language
9. https://watermark.silverchair.com/lzw002.pdf?token=AQECAHi208BE49Ooan9kkhW_Ercy7Dm3ZL_9Cf3qfKAc485ysgAAAr4wggK6BgkqhkiG9w0BBwagggKrMIICpwIBADCCAqAGCSqGSIb3DQEHATAeBglghkgBZQMEAS4wEQQMd_iLFs3rMVUfC_GTAgEQgIICcYkw-d53edR4QO3h3UJiFE9tU7_7xKp6hQ5QTrhhMMuH25ffj0GBMJuxOT20GOwOoOMzPOuQW_UhoGmlQkLgMqnyeEF-3qIfSF19H-tqWYKku_GXiuM-ITNZx2d3074yZSVgPq35-dLbm2sIVnPnBfKlEymv66fiG_z22J0pgdPQA2XugbxHT-Evw1wmybFXike1bO3mSsqHmBZWlUs-8T3Z5_xZ9elx96c4Pf1EBk1yBMq9u1FLFXIaj-Dlp8RZcTOsYna4Snga2Qa8ChhEPhFNIMUoSyPhEBFIVnlEnRtFwhcmNkHQ-fDIVfAcZz0MFLaMLVuQuCSPX_vvmBZyMMUAQDl-8pq_d5kCGHrqtZFBieX8hLe8huBjpuJb6zNJ6krBqSS5YwuNNVdpYpf7Bd7doOB6p5WFg9tvaHv1Vd4v76xjHrezhZ4Wr3sKJ_J0xBG4S7D11WdlnCvrX7MCacqAy0TlTIG3daaNA8bC5C9fVMwEUyRL4Y3NHDEcIslqq9VV0FL9MpbioV-UH8nAM-WqK8s2POFqMrjqVClHSEiClr34vcZPJLVUATbNGD9mwXhJz-yp4m57oR2gCj0ozeh7uvtKMlLM6j4TJbU4l6gX5SIRSWTYa_TD5wRhlevMl7FXabvZUxibRFKLvLoB0ih0Y2Mw70cg91Wao6TB0JXphX65-zBqpW-yechHGEh34el1Q9XS8rCVhGqpHG6mpQUXv0ywB6DZkDcVGE6LCVv8T4r_7lah4pVpZoNvBtoq8LpPo3eyl69KPZz-kAPm37uATEWGIe3Sxrm4VroQVXNFHYY-wdCoJFZDzq1pNt1FMS4
10. https://www.uni-due.de/SHE/REV_PhoneticsPhonology.htm
11. https://www.internationalphoneticassociation.org/icphs-proceedings/ICPhS1999/papers/p14_0727.pdf
12. http://cdn.iiit.ac.in/cdn/ltrc.iiit.ac.in/hutb_release/related_publications/ICON09.pdf
13. https://en.wikipedia.org/wiki/Verb–subject–object_word_order