Introductory notes:

Syntax as a Cognitive Science, Syntax – the Scientific Method, Prescriptive and descriptive grammar, the study of grammar, studying Syntax, Learning vs. Acquisition, Innateness: Language as an Instinct, The Logical Problem of Language Acquisition, Other Arguments for UG.

ENG467: Syntax and Structures of Language

Syntax as a Cognitive Science

- Cognitive science is a cover term for a group of disciplines that all have the same goal: describing and explaining human beings' ability to think (or more particularly, to think about abstract notions like subatomic particles, the possibility of life on other planets, etc.
- One thing that distinguishes us from other animals, even relatively smart ones like chimps and elephants, is our ability to use productive, combine words into a meaning sentence in a language to express our thoughts and ideas.
- Language plays an important role in how we think about abstract notions.
- The discipline of linguistics is thus one of the important subdisciplines of cognitive science.
- Sentences are how we get at expressing abstract thought processes, so the study of syntax is an important foundation stone for understanding how we communicate and interact with each other as humans.

We all have grammar of our language (or languages that we know and speak) in our subconscious mind.

This enables us to generate an infinite number of words / sentences everyday.

That means we all know subconsciously the syntax of our language.

We all have competence in our language.

Competence means our the knowledge of our native language or what we know of our language.

And we are able to produce or speak our language.

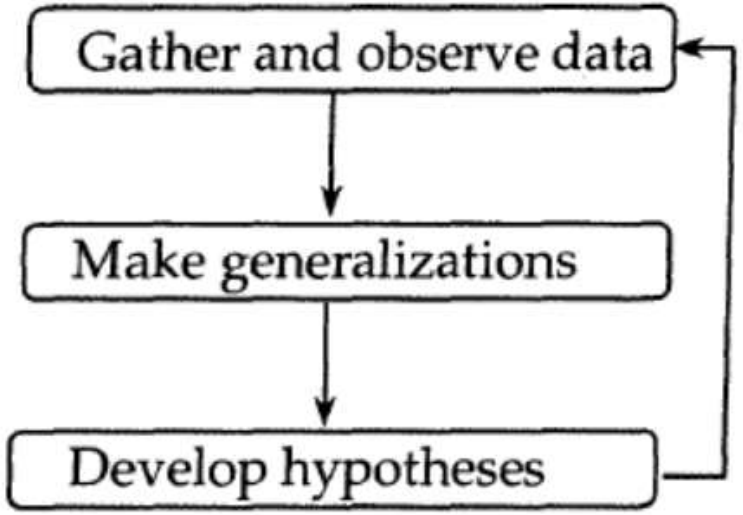
This ability to speak language in real life situation is called **Performance**.

So, performance is the kinds of language that are actually produced and heard.

Syntax – the Scientific Method

- Science is perhaps one of the most poorly defined words of the English language.
- When we hear science what comes to our mind is Physics, biology, or chemistry.
- Among scientists science typically refers to a particular methodology for study: the deductive scientific method.

- The scientific method dates back to the ancient Greeks, such as Aristotle, Euclid, and Archimedes. The method involves observing some data, making some generalizations about patterns in the data,. developing hypotheses that account for these generalizations, and testing the hypotheses against more data. Finally, the hypotheses are revised to account for any new data and then tested again.
- A flow chart showing the method is ..



- In syntax, we apply this methodology to sentence structure.
- Syntacticians start by observing data about the language they are studying, then they make generalizations about patterns in the data (e.g., in simple English declarative sentences, the subject precedes the verb). They then generate a hypothesis about these patterns and test the hypothesis against more syntactic data, and if necessary, go back and re-evaluate their hypotheses.
- Hypotheses are only useful to the extent that they make predictions.
- In syntax, hypotheses are called rules, and the group of hypotheses that describe a language's syntax is called a grammar.

- Language is a system that associates sounds (or gestures) with meanings in a way that uses words and sentences.
- Linguistics is the scientific study of human language. It tries:

  first, to observe languages and to describe them accurately,

  then, to find generalizations within what has been described,

  finally, to draw conclusions about the general nature of human language.

What is Grammar?

- A grammar is a complex system of rules that governs how speakers organize sounds into words and words into sentences.
- The word Grammar, is derived from the Greek word, Gramma, which signifies a letter.
- A grammar of language is a description of the four components of language, namely, the sounds (phonology), words (morphology) sentences (syntax) and meaning (semantics).
- *So, Grammar* refers to the set of rules that structure a language.
- A grammar of a language is often codified as a set of rules. All of us abide by certain rules in society. All languages have fixed parameters or set of rules at each level which are to be followed to produce 'grammatical' utterances. The number of sentences in a language is infinite set to a "finite system of sentence forming principles.

The parts of Grammar

- Grammar is a language system, a set of principles (rules) that underlie a language.
- Mental Grammar – the knowledge of language that allows a person to produce and understand utterances
- Grammar can be described as having different parts:

• phonetics

• phonology

• morphology

• syntax

• semantics

• pragmatics

Since linguists study all of these, the terms are also used to refer to subfields of linguistics.

- We’re concerned with **two of these kinds of grammars**:

- **descriptive grammar** which has as its goal a description of the usage of native speakers of a language;
- **prescriptive grammar** which has as its goal to control the usage of native speakers of a language

Descriptive vs. Prescriptive Approach to Language

Prescriptive Grammar

- It is a set of rules and examples dealing with the syntax and word structures of a language, usually intended as an aid to the learning of that language.
- Prescriptive grammar refers to the structure of a language as certain people think it should be used.
- It prescribes the norms for grammatical correctness, linguistic purity and literary excellence, and how speakers should use the language.
- It provides the rules about the structure of a language. It also deals with what the grammarian believes to be right and wrong, good or bad language use;
- Traditional grammar tends to be prescriptive. It lays down the norms of correct usage, the ‘dos’ and ‘don’ts’. It is quite dogmatic, and makes clear distinctions between ‘good’ and ‘bad’ grammar.

Some Rules of Prescriptive Grammar

1. Never end a sentence with a preposition.

   Eg : There's the man I spoke **to**.

   There's the man **to** whom I spoke.

2. Never begin a sentence with 'And'.

   Eg. And how are you?

   How are you?

3. Do not split the infinitive

   Eg : To boldly go where no one has gone before.

   To go boldly where no one has gone before.

4. Don't use WHO in place of WHOM.

   Eg : "Who did you call?"

   I don't know who to see.

   I don't know **whom** to see.

5. A sentence starts with a capital letter and ends with a period/full stop, a question mark or an exclamation mark.

   Eg : The television is broken. It needs to be fixed.

6. Use subject pronouns after the verb to be.

   Eg : It was I who called you.

   NOT

   It was me who called you.

7. The subject of a sentence must agree with the verb .

   Eg : I/you want to eat mango. He/she wants to eat mango.

   The instructions are clear.

   NOT

   The instructions is clear.

8. The order of a basic **positive** sentence is **Subject-Verb-Object**.
(**Negative and question sentences** may **have a different order**.)

9. **Every sentence** must have a **subject** and a **verb**. An object is optional. Note that an imperative sentence may have a verb only, but the subject is understood.

10. The **subject and verb must agree** in **number**; that is, a singular subject needs a singular verb and a plural subject needs a plural verb.

- Prescriptive rules require :
  - Effortful to follow
  - Need to be taught
  - Need to be memorised

Descriptive approach

- **Descriptive grammar:** the systematic study and description of a language based on how it is actually used/spoken.
- It is based on what its native speakers accept and understand as part of their language.
- It describes the way people speak or write their native language.
- Linguists attempt to describe the grammar of the language that exists in the minds of its speakers, i.e. to create a model of speakers' mental grammar.
- In a descriptive grammar there is No right or wrong language.
- Prescriptive grammar has been replaced by modern descriptive grammar, which describes language as it is, not as it should be.

- Modern descriptive grammar came rather later:
  - A Grammar of Contemporary English by Quirk et al. (1972),
  - A comprehensive grammar of the English language by Quirk et al. (1985),
  - The Oxford English grammar by Greenbaum (1996),
  - The Longman grammar of spoken and written English by Biber et al. (1999) and
  - The Cambridge grammar of the English language by Huddleston and Pullum

- It is a set of rules about language based on how it is actually used.
- No right or wrong language.

- **Approach**:

  Observe principles that describe the way the language is actually spoken.
- **The goal** of the descriptive approach is a description and knowledge of rules (principles) of how the language is actually spoken.

Some descriptive rules of English

A descriptive grammar therefore will specify many rules for structures in which no native speaker will ever produce anything except a single form

1. In English, the article precedes the noun and any adjectives modifying the noun.

    a. The short people moved.

    b. *Short the people moved.

    c. *Short people the move.

2. In English, demonstratives agree in number with the nouns they modify: ***that*** and ***this*** go with singulars; ***those*** and ***these*** go with plurals.

    a. That dog is surprisingly fond of these bones.

    b. *Those dog is surprisingly fond of this bones.

3. Use only one question word at the beginning of an English sentence.

    a. Who said what?

    b. *Who what said?

    c. *What who said?

A descriptive grammar will also specify rules which allow variation in structures which speakers use variably.

Speakers of more or less standard dialects of American English

4. typically use objective pronouns after copular verbs;

    a. That is me.

    b. It’s him.

    c. The guy in the front row with the red hat is him.

5. Auxilary verbs come before the subject in questions

Eg : What has she done?

NOT

What she has done?

6. Form the plural of a noun by adding -s

Eg : Three books

NOT

Three book

- DG attempts to DESCRIBE the phonological, morphological and syntactic rules that native speakers (L1) INTUITIVELY follow.

- When a descriptive RULE is VIOLATED, it is very apparent to the L1 of the language.

  Violation = makes a sentence sound unnatural/weird.

- Descriptive rules are followed EFFORTLESSLY by L1.

Learning vs. Acquisition

- One of the most common misconceptions about Language is the idea that children and adults "learn" languages.
- The basic kind of knowledge we are talking about here is subconscious knowledge. When producing a sentence we don't consciously think about where to put the subject, where to put the verb, etc.
- Our subconscious language faculty does that for us.
- Cognitive scientists make a distinction in how we get conscious and subconscious knowledge.
  - Conscious knowledge (like the rules of algebra, syntactic theory, etc.) is learned.
  - Subconscious knowledge, like how to speak or the ability to visually identify discrete objects, is acquired.

- The two words Learning and Acquisition can be better explained in learning a language.
- **Learning** is conscious and **acquiring** is subconscious
- Learning is knowledge developed consciously by instruction or study.
- Acquisition is developing a skill, habit, or quality using the subconscious part of the mind.

Acquisition

- The acquisition method of acquiring a language is one by which every child learns his mother tongue. Here, he is not taught grammar the manner he is given lessons when he ultimately goes to school.
- However, it is easy to see that, without any instructions, children learn the native language and do not make grammatical mistakes during conversations.
- They learn the language through a subconscious process where they know nothing about rules of grammar but know intuitively what is right and wrong or learn through a trial and error method.
- Constant communication is what makes acquiring the lessons of the mother tongue easier for kids.
- Children learn the language as communication is a must for them to survive. They are helped in this endeavor a great deal by the innate capacity of human beings to acquire a language. Though parents never explain the concepts of grammar, the child learns and masters them on his own with the help of exposure to communication in the language. The basic tool needed for language acquisition is a source of communication that is natural.

Learning

- Learning of a language is the formal teaching methodology that can be seen in the form of instructions explaining the rules of the language.
- Here, the emphasis is on the form of language rather than text and the teachers are seen busy explaining grammar rules to students.
- Students are happy that they are getting a command of the grammar, and they can even take grammar test in the language they are learning.
- However, it is seen that knowing grammar rules is not guarantee of a good command over spoken language though the student might qualify language tests that are standardized.
- Sadly, most of the adult language learning is based upon this method of teaching that relies on form rather than text, and places undue importance on the rules of grammar.

What is the difference between Learning and Acquisition?

- Acquisition of a language requires meaningful communication in the language which is also called natural communication.
- Learning of a language is based upon less communication and more explanation of grammar rules.
- During acquisition, a child is not aware of grammar rules and he intuitively learns what is right or wrong as there is constant meaningful communication.
- Acquisition is subconscious while learning is conscious and deliberate.
- In acquisition, learner focuses more on text and less on form while he focuses on form alone in the learning process of a language.
- Mother tongue is mostly acquired while second language is mostly learnt.

Innateness: Language as an Instinct

- If you think about the other types of knowledge that are subconscious, you'll see that many of them (for example, the ability to walk) are built directly into our brains – they are instincts. No one had to teach you to walk (despite what your parents might think!). Kids start walking on their own. Walking is an instinct. Probably the most controversial claim of Noam Chomsky's is that Language is also an instinct. Many parts of Language are built in, or innate. Much of Language is an ability hard-wired into our brains by our genes.

- Obviously, particular languages are not innate. It is never the case that a child of Hindi parents growing up in North America who is never spoken to in Hindi grows up speaking Hindi.
- They'll speak English (or whatever other language is spoken around them). So on the surface it seems crazy to claim that Language is an instinct. There are very good reasons to believe, however, that a human facility for Language (perhaps in the form of a "Language organ" in the brain) is **innate**. We call this facility **Universal Grammar** (or UG).

The Logical Problem of Language Acquisition

- What follows is a fairly technical proof of the idea that Language is at least plausibly construed as an innate, in-built system.
- The argument is that a productive system like the rules of Language probably could not be learned or acquired. Infinite systems are in principle, given certain assumptions, both unlearnable and unacquirable. Since we all have such an infinite system in our heads, we shouldn't have been able to acquire it. So it follows that it is built in.

- For example let take the classical form of an argument by modus ponens:

Premise (i): Syntax is a productive, recursive and infinite system.

Premise (ii): Rule-governed infinite systems are unlearnable.

Conclusion: Therefore syntax is an unlearnable system. Since we have it, it follows that at least parts of syntax are innate.

- Let's start with premise (i). Language is a productive system. That is, you can produce and understand sentences you have never heard before. For example, I can practically guarantee that you have never heard the following sentence:

1) The dancing chorus-line of elephants broke my television set.

The magic of syntax is that it can generate forms that have never been produced before. Another example of this productive quality lies in what is called recursion. It is possible to utter a sentence like (19):

2) John loves magazine ads.

3) I think [John loves magazine ads].

4) Mary believes [I think [John loves magazine ads]].

5) Daina doubts that [Mary believes [I think [John loves magazine ads]]].

And so on….

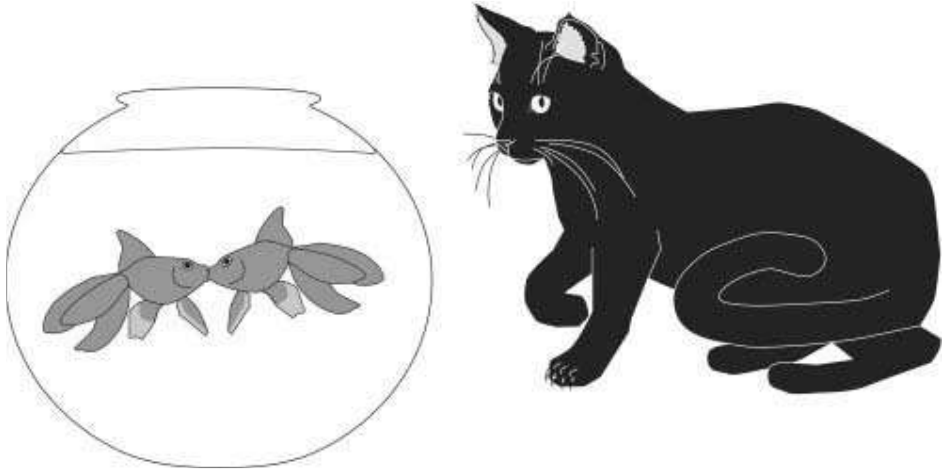
- This means that Language is a productive (probably infinite) system. There are no limits on what we can talk about.
- Other examples of the productivity of syntax can be seen in the fact that you can infinitely repeat adverbs (23) and you can infinitely add coordinated nouns to a noun phrase (24):

6) a) a very big peanut
   b) a very very big peanut
   c) a very very very big peanut
   d) a very very very very big peanut
   etc.

- Let's now turn to premise (ii), the idea that **infinite systems are unlearnable**.
- In order to make this more concrete, let's consider an algebraic treatment of a linguistic example. Imagine that the task of a child is to determine the rules by which her language is constructed. Further, let's say a child has to match up situations in the real world with utterances she hears.

- So upon hearing the utterance ***the cat spots the kissing fishes***, she identifies it with an appropriate situation in the context around her (as represented by the picture).

7) “the cat spots the kissing fishes” =



Her job, then, is to correctly match up the sentence with the situation.

This matching of situations with expressions is a kind of mathematical relation (or function) that maps sentences onto particular situations. Another way of putting it is that she has to figure out the rule(s) that decode(s) the meaning of the sentences. It turns out that this task is at least very difficult, if not impossible.

- In an infinite system you can't hear them all, even if you were to hear 1 sentence every 10 seconds for your entire life. If we assume the average person lives to be about 75 years old, if they heard one new sentence every 10 seconds, ignoring leap years and assuming they never sleep, they'd have only heard about 39,420,000 sentences over their lifetime. This is a much smaller number than infinity.
- Despite this poverty of input, by the age of 5 most children are fairly confident with their use of complicated syntax.
- So, productive systems are (possibly) unlearnable, because you never have enough input to be sure you have all the relevant facts. This is called **the logical problem of language acquisition.**

Other Arguments for UG

- There are many other arguments that support the hypothesis that at least a certain amount of language is built in.
- An argument that is directly related to the logical problem of language acquisition discussed above has to do with the fact that we know things about the grammar of our language that we couldn't possibly have learned.
- Start with the data in (1). A child might plausibly have heard sentences of these types (the underline represents the place where the question word ***who*** might start out – that is, as either the object or the subject of the verb ***will question***):

8) a) Who do you think that John will question _____first?

b) Who do you think John will question _____first?

c) Who do you think _____ will question Mary first?

The child has to draw a hypothesis about the distribution of the word ***that*** in English sentences. One conclusion consistent with these observed data is that the word ***that*** in English is optional. You can either have it or not.

Unfortunately this conclusion is not accurate. Consider the fourth sentence in the paradigm in (28). This sentence is the same as (28c) but with a that:

d) *Who do you think that _____ will question Mary first?

- It appears as if ***that*** is only optional when the question word (***who*** in this case) starts in object position (as in 8a and b). It is obligatorily absent when the question word starts in subject position (as in 8c and d) (don't worry about the details of this generalization). What is important to note is that ***no one*** has ever taught you that (8d) is ungrammatical. Nor could you have come to that conclusion on the basis of the data you've heard.
- The logical hypothesis on the basis of the data in (8a–c) predicts sentence (8d) to be grammatical. There is nothing in the input a child hears that would lead them to the conclusion that (8d) is ungrammatical, yet every English-speaking child knows it is.

  One solution to this conundrum is that we are born with the knowledge that sentences like (**8d) are ungrammatical.**

References

1. Carnie, A. (2021). Syntax: A Generative Introduction (Fourth Edition). Wiley Blackwell.

2. https://www.differencebetween.com/difference-between-learning-and-vs-acquisition/