



# "THE GREAT AUTOMATIC GRAMMATIZATOR"

TEAM NAME: MORPHEME

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# SKINNER'S THEORIES

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- learned by observation from the external world.
- compared it to skinner box (discussed in detail later)
- learn through reinforcement and punishment

# CHOMSKY'S THEORY

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- language is innate, simply developed over the years
- language acquisition device
- poverty of stimulus theory
- all children are born with "universal grammar"(ability to learn **grammar** is built into the human brain from birth regardless of language. )
  - A) learn language at almost same age
  - B) grasp language very quickly and effortlessly
  - C)Deaf children make up their own language that somewhat resembles each other
- example of dogs
- Language is in a way natural to human beings

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- Gives rise to the "Nature-Nurture" theory. (inherited or acquired)
  - Today, most researchers acknowledge that both nature and nurture play a role in language acquisition. However, some emphasize the nurture aspect whereas others the nature aspect

# SKINNER BOX

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Make rats/pigeons do task by:

1. breaking down tasks into steps
2. rewarding

- put hungry rat in skinner box
- accidentally presses lever and is rewarded with pellet of food
- pressing lever is operant response that is voluntary
- food is reward
- difficulty increased

# CHOMSKY'S CRITICISM OF SKINNER BOX

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1→ behaviour of rats is irrelevant to human language

2→ Skinner fundamentally misunderstood the nature of language

## IRRELEVANCE OF RATS

→ behaviour of rats was predictable, but we can never predict what a person will say. Eg) On seeing a beautiful painting

→ rats were repeatedly rewarded

→ notion of response strength. Rat learns to respond with a certain speed, force or frequency.

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## NATURE OF LANGUAGE

→ structure dependent operations, every sentence has an inaudible internal structure that has to be understood.

# THE MARTIAN EXAMPLE TO EXPRESS THE NATURE OF LANGUAGES

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1→ Used because it's a totally different language having no similarity with the languages of Earth.

2→ Used to show that our language is structure-dependent.

3→ Here we give some sentences with the related question and the Martian tries to find rules of question formation.



# FIRST EXAMPLE:

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*AUNT JEMIMA HAS DROPPED HER FALSE TEETH DOWN THE DRAIN*

as well as the related question:

*HAS AUNT JEMIMA DROPPED HER FALSE TEETH DOWN THE DRAIN?*

The first guess that the Martian might make could be to bring the word ‘*has*’ to the start of the sentence to make that sentence a question.

This might work in some cases but it’s still not a universally accepted rule. We should take the following example.....

*THE MAN WHO HAS RUN AWAY SHOUTING WAS ATTACKED BY A WASP*

Into:

*\*HAS THE MAN WHO RUN AWAY SHOUTING WAS ATTACKED BY A WASP?*

Even though it follows the first rule, this sentence is clearly not English.

# SECOND EXAMPLE:

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Now, discarding the first rule, the Martian might assume that in order to form a question, we have to bring the third word to the front, like in the case of the following sentences:

*THE ALLIGATOR HAS ESCAPED*

would correctly become:

*HAS THE ALLIGATOR ESCAPED?*

*But,* this is also not universally accepted,

*HE HAS GONE TO MARKET*

would become:

*\*GONE HE HAS TO MARKET?*

Which is not English, even though it follows the above rule.

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Here we can see that the Martian cannot make any specific rule to govern the question making. This is due to the fact that our Language is structure-dependent ,i.e.,

*AUNT JEMIMA, THE MAN WHO HAS RUN AWAY SHOUTING, HE,*

all behave as a unit of sentence. The number of words within each unit is irrelevant, so no amount of counting will produce the right result for question formation.

*FOR EXAMPLE:*

AUNT MARY	HAS	DROPPED HER FALSE TEETH
		DOWN THE DRAIN

# CHOMSKY'S VIEWS

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- 1→ structure-dependent operation has no advantages from the point of view of communicative efficiency or 'simplicity'.
- 2→ if we had to do some formal manipulations using a computer, a structure independent language would be much easier.
- 3→ yet children seem to automatically know the structure dependent operations even though they do not go through the prolonged phase of testing like Martians.

# CHOMSKY'S VIEWS (CONTD...)

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4→ Simple slot filling operations are inadequate as explanations of language.

For example:PERFORMING FLEAS

CAN BE

AMUSING

PLAYING TIDDLYWINKS

CAN BE

AMUSING

PERFORMING FLEAS

ARE

AMUSING

\*PERFORMING FLEAS

IS

AMUSING , which is incorrect

similarly,

\*PLAYING TIDDLYWINKS

ARE

AMUSING, which is incorrect

PLAYING TIDDLYWINKS

IS

AMUSING

# CHOMSKY'S VIEWS (CONTD...)

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5→language is organized at 2 levels- a *surface* level, in which words are in the place where they actually occur, and a *deep* level, in which words are located in their 'proper' place in the slot structure

Eg: he saw a person on top of the hill with a telescope.

→ it might mean that he saw someone using a telescope.

→ he saw someone using a telescope on top of the hill.

# EXPERIMENT CARRIED OUT BY PSYCHOLINGUISTS

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Experiments carried out by psycholinguists have made it clear that listeners do not have to rely on auditory clues for interpreting the main structural divisions. For example, the sentence,

GEORGE DROVE FURIOUSLY TO THE STATION:

1) IN ORDER TO CATCH HIS TRAIN GEORGE DROVE FURIOUSLY TO THE STATION.

2) THE REPORTERS ASSIGNED TO GEORGE DROVE FURIOUSLY TO THE STATION.

We have to make breaks in the above sentences to understand it fully,

IN ORDER TO CATCH HIS TRAIN	GEORGE DROVE FURIOUSLY TO THE STATION.
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THE REPORTERS ASSIGNED TO GEORGE	DROVE FURIOUSLY TO THE STATION.
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# CREATIVITY AS A FUNDAMENTAL ASPECT OF LANGUAGE

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- Our utterances at any point of time are not controlled (although maybe affected) by external happenings.
- We cannot possibly list a finite set of responses for any particular situation.
  - ✓ For example, on seeing a tree, we do not shout 'tree', we can say anything from 'there could be shade under the tree' to 'this is the tree my grandfather planted this tree when he was a child'.
- This creative aspect of language is *normal* for humans, if someone is unable to execute this creative aspect of language, we would assume he/she is brain damaged

*"It is important to bear in mind that the creation of linguistic expressions that are novel but appropriate is the normal mode of language use. If some individual were to restrict himself largely to a definite set of linguistic patterns, to a set of habitual responses to stimulus configurations . . . we would regard him as mentally defective, as being less human than animal."*  
-Chomsky



# CREATIVITY AS A FUNDAMENTAL ASPECT OF LANGUAGE

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- Language is defined by a strict set of rules and structures we have not been able to build an 'automatic grammatizator' so far.
- In the short story by Roald Dahl, the protagonist deduces that language follows a strict structure and almost mathematic principles, he can invent a machine that exploits these principles to write a story in half an hour.
- Linguists have not been able to build such a machine so far
- One major thing to notice here is the fact that children manage to learn the intricacies of language at a very young age
- They have lesser data to handle than linguists and very few interactions with people.
- Yet within a few years, a child is capable of making novel sentences.
- This leads us to the question, HOW DO HUMANS DEVELOP AUTOMATIC GRAMMATIZATORS FOR THEMSELVES?

# HOW DO HUMANS DEVELOP 'AUTOMATIC GRAMMATIZATORS' ?

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- Possibility 1: THE INNATENESS HYPOTHESIS
  - The Innateness Hypothesis or Chomsky Hypothesis suggests that humans are born with a skeletal framework of language programmed within us genetically.

*" Some kinds of bats home in on flying insects using Doppler sonar. Some kinds of migratory birds navigate thousands of miles by calibrating the positions of the constellations against the time of day and year. In nature's talent show we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale."*

-Steven Pinker(The Language Instinct)

- Using the word 'innate' lead people to believe that it means 'ready-to-use', Chomsky does not mean that we are born with perfect knowledge on the vocabulary and rules of language and are ready to speak, he means we are born with a 'blueprint' for it

# HOW DO HUMANS DEVELOP 'AUTOMATIC GRAMMATIZATORS' ?

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- Possibility 2: HUMANS AS EFFICIENT PUZZLE SOLVERS
  - This theory suggest that we as humans are excellent (and highly efficient) puzzle solvers with language being just another puzzle we subconsciously crack.
  - In the words of the linguist Geoffrey Sampson: *Individual humans inherit no 'knowledge of language' . . . they succeed in mastering the language spoken in their environment only by applying the same general intelligence which they use to grapple with all the other diverse and unpredictable problems that come their way.*