Lecture 3 Properties of human language

- animal communication systems
- properties of human language
- Can nonhuman animals acquire human language?

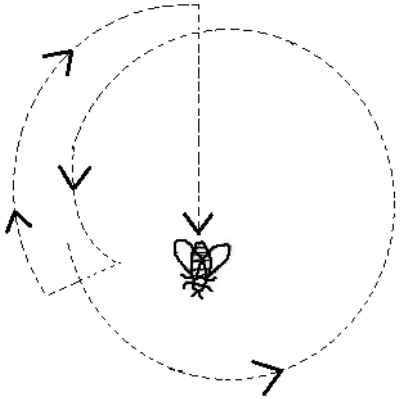
Animal communication systems

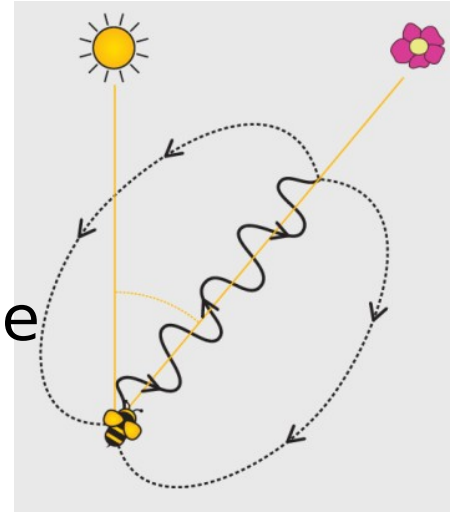
- **Bird calls**

- **call repertoire**: ~5-10, but varies greatly
- **functions of calls**: food calls, alarm calls, contact calls, flight calls, aggressive calls, …
- **Most calls are innate, but seem not always so.**
- Geographical “dialects” are documented.
- Some birds can learn novel calls from their adopted parents or birds caged together.
- Some calls can be modified by exposure to tapes.
- a sensitive period

Animal communication systems

- **Honeybee dance**
- Two types
- Round dance (shorter distance)
  Waggle dance (longer distance)
- Components
- straight run, waggling run, sound burst
- Messages:
- distance
- direction
- even the subjective evaluation of the food source's profitability



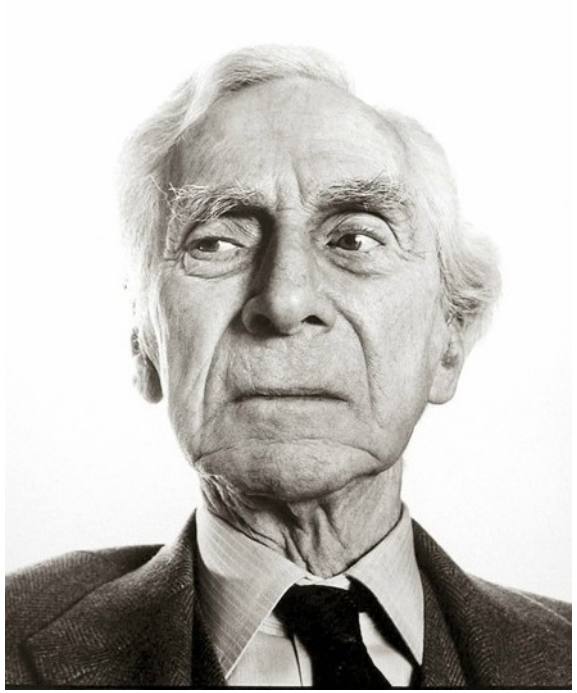


Animal communication systems

- **Nonhuman primate calls**
- a restricted repertoire of distinct calls
- Putty-nosed monkey use ‘pyows’ primarily when a leopard is nearby and ‘hacks’ mainly in response to crowned eagles
- Bonobos produce 5 distinctive calls in response to different foods.
- different combinations
- culturally transmitted
- geographical “dialects”

Are these animal communication systems the languages in our sense?

- **No matter how well a dog barks, he cannot t ell you that his parent s are poor but honest.**
  - ***Bertrand Russel***



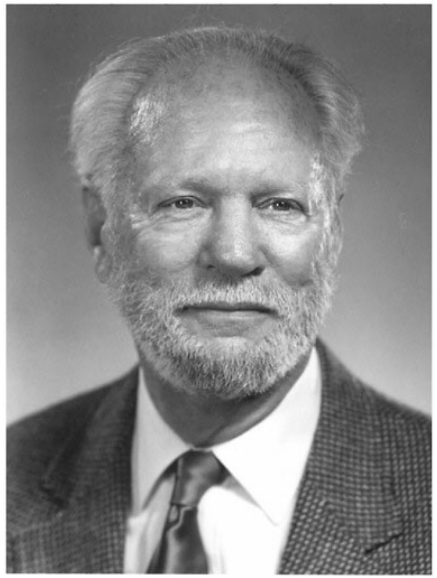
20th century philosopher
Nobel Prize for Literature in 1950

Language is a defining feature of humans.

- Capacities claimed to make humans distinct from other creatures:
- bipedalism
- superior cognitive abilities (tool making, fire keeping, cooking, games, laws, …)
- …
- **language!**

- But what are the key properties of human language?

The design features of human language



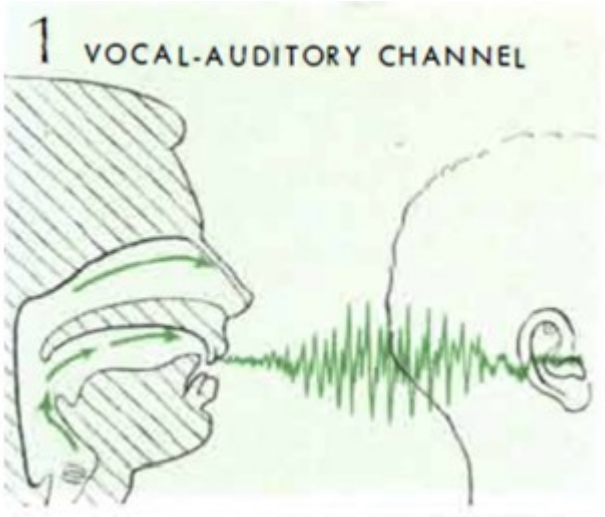
- American linguist and anthropologist **Charles F. Hockett** (1916-2000)
- Propose a set of 16 design features of human language.

Design features of human language

- **Use of auditory-vocal channel**

- Signals are transmitted primarily through the auditory-vocal channel.

- That is, language signals are produced by the vocal organ and received by th



Design features of human language

- **Broadcast transmission and directional reception**

- When humans speak, sounds are transmitted in all directions;

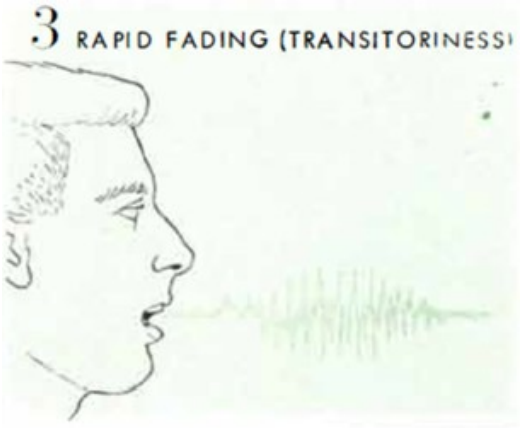
- Listeners perceive the direction from which the sounds are coming.

Design features of human language

- **Rapid fading**

- Speech signals are transitory, and do not persist in the environment once uttered (unlike animal tracks, or writing)

- Redundancy, according to Hockett, is a consequence of the transitory nature of speech.
- E.g., “John is completely and entirely crazy about her.”
- “Last year I visited the Eiffel Tower, the tallest steel construction in the center of Paris.”



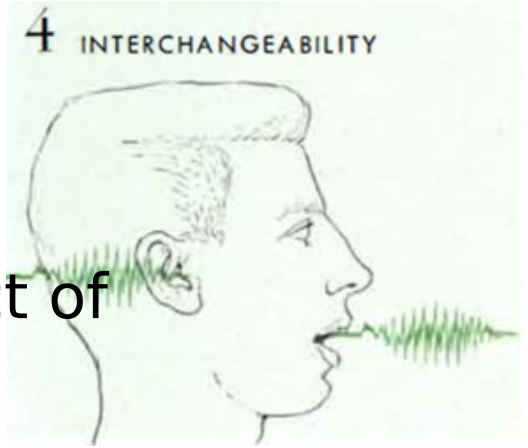
Design features of human language

- **Interchangeability**
- Speakers of a language can reproduce any linguistic message they can understand.

- In other words, anything that one can hear, one can also say, regardless of their truth or relation to the speaker. (e.g., I failed in…)

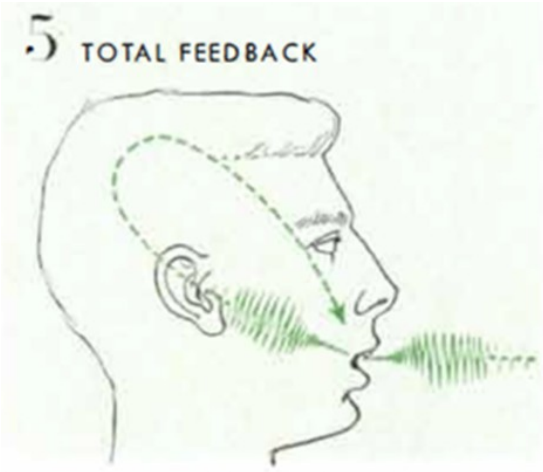
- Individuals can be both senders and receivers.

- one of the bases of the interactive, social aspect of language.



Design features of human language

- **Total feedback**
- Speakers can also receive the signals that they emit.
- Speakers hear and can reflect upon everything that they say.
- For some animals, a sender may not be able to see their own body signals.

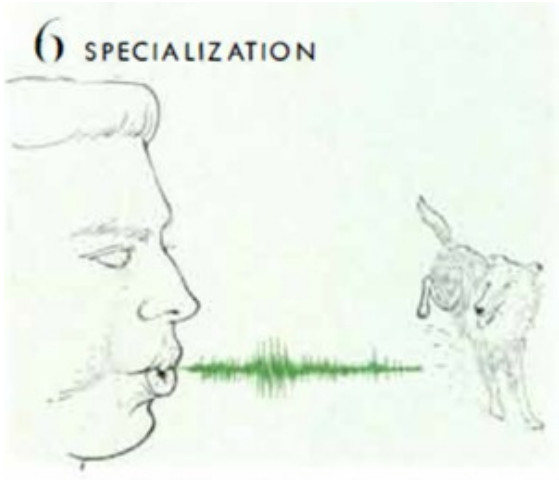


Design features of human language

- **Specialization**

- Language signals are specialized for communication and do not serve any additional physiological function.

- The sounds accompanying the panting of dogs



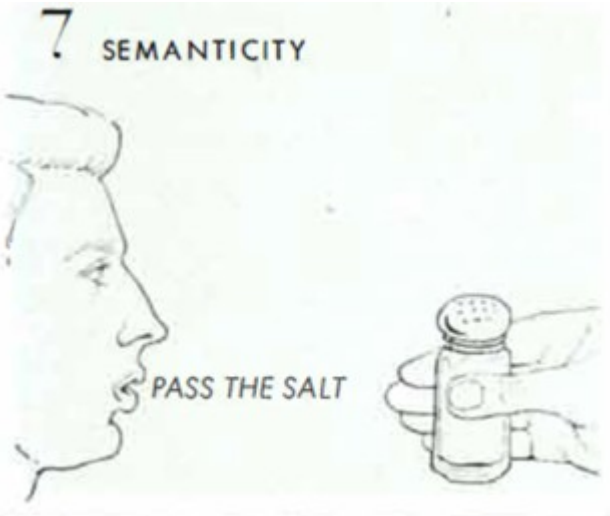
Design features of human language

- **Semanticity**

- A signal is meaningful.

- In Hockett's words, ''there are relatively fixed associations between elements in messages (e.g., words) and recurrent features or situations of the world around us.''

- That is to say, language signals refer to something other than themselves: entities, ideas, states of affairs, feelings and so on.



Design features of human language

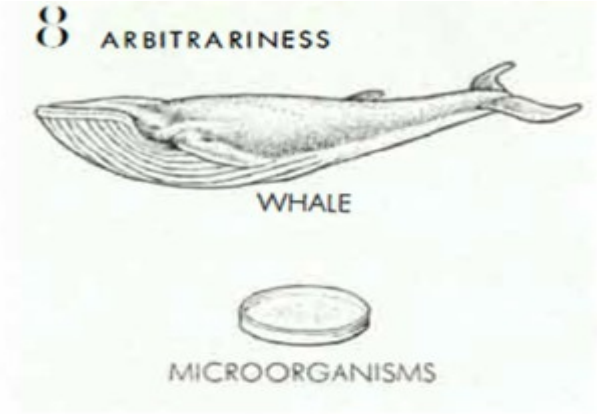
- **Arbitrariness**

- The signal does not resemble the thing that it denotes.

- There is no intrinsic or logical connection between a sound form (signal) and its meaning.
- (unlike the speed of bee “dancing”, which directly reflects the distance of the nectar from the hive).

- But, most spoken languages have a small number of iconic, onomatopoeic words that imitate sounds.

- Arbitrariness does not mean randomness.



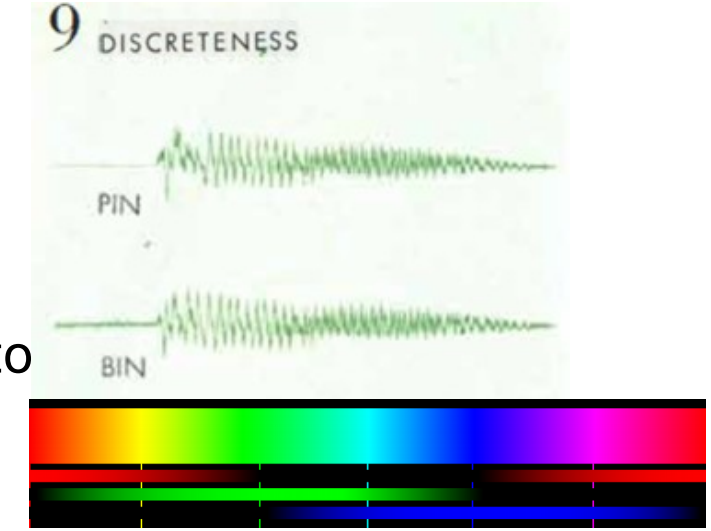
Design features of human language

- **Discreteness**
- The range of sounds that human beings can make is continuous.

- But all languages divide that continuous space of sound into discrete, incremental territories. Speech sounds are perceived categorically, not continuously. (e.g., "bin", "pin")

- Discreteness also shows itself in other modules of language, for example, meaning.

- Precisely what is discrete varies from one language to another.

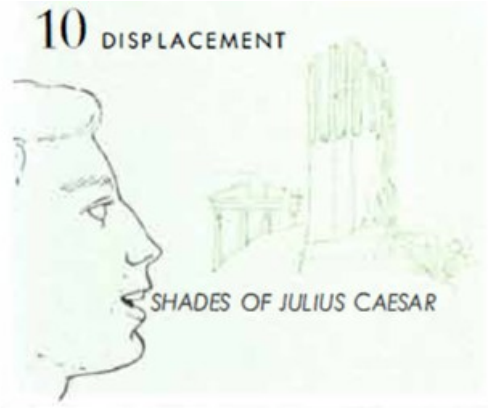


Design features of human language

- **Displacement**
-
- The referent of the message may be removed in time or space.

- Human language can be used to talk about events remote in space or time from the situation of the speaker or even events that do not exist.
- (unlike animal warning calls, which generally refer to immediate threats)

- Bee dancing?



Design features of human language

- **Productivity**

- Language can be used to communicate novel messages that have not been uttered or heard before.

- Speakers can compose new messages, not just reproduce a fixed repertoire of previously memorized sounds. And listeners can understand them.

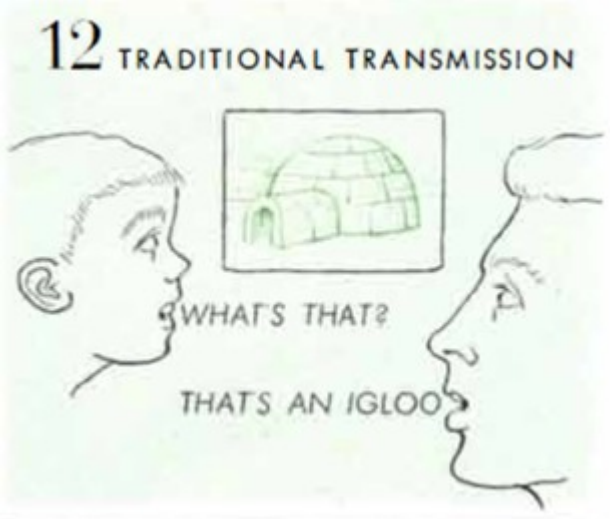
- Bee dancing?
- can report new source of nectar
- seems only communicate horizontal locations

Design features of human language

- **Traditional/cultural transmission**

- Specific words and grammatical structures of a language are transmitted from one generation to the next primarily by a process of teaching and learning

- Bird calls and songs?

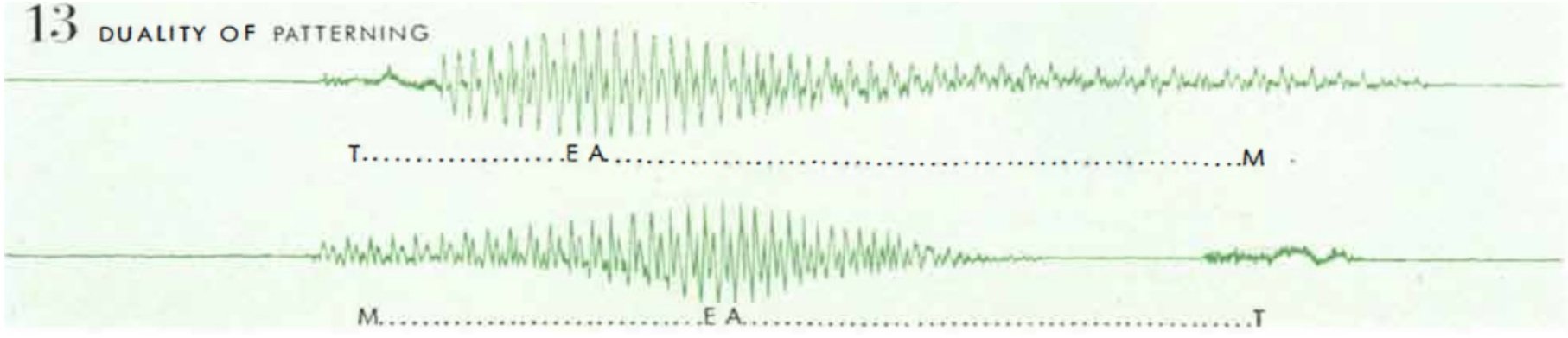


Design features of human language

- **Duality of patterning**

- Human language is organized at two levels or layers simultaneously:
- meaningless units (phonemes)
- meaningful units (morphemes, words, …)

- Economical tool



Design features of human language

- **Prevarication**

- Linguistic messages can be false, deceptive and meaningless.
- Colorless green ideas sleep furi

Design features of human language

- **Reflexiveness**

- Language can be used to communicate about the very system it is; i.e. language can discuss language.
- e.g. “I wish he wouldn’t use so many technical terms.”

Design features of human language

- **Learnability**

- Language is teachable and learnable.
- A speaker of a language can learn another language.

Design features of human language

- **Structure dependence**

- Linguistic rules are sensitive to the grammatical structure of sentences, rather than the linear position of words.

- *The President **is** eating a hamburger.*
- *The President who has just visited a local high school **is** eating a hamburger.*

Design features of human language

- **Recursion**
- One phrase can be embedded inside another, without limit.
- *He said that she said that I said that they believed that you told us that . . .*
- *The mouse the cat the dog the man walked barked at chased ate the cheese.*

- **Properties not common to human language**
- **Properties not unique to human language**
- **Properties unique to human language**

Do animals have languages in our sense?

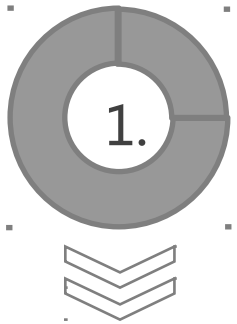
Questions for further thinking

- 1. What are the most important characteristics of human language?
- 2. Provide a language example for each of the design features, and a language counter-example to them if possible.
- 3. Do you have any hypothesis about the temporal sequence of the appearance of these features?

Can animals acquire human language?

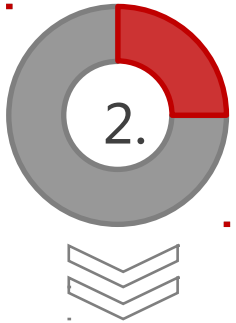
- Animals seem to “understand” some human words.
- - talking to your pets or other tamed animals
-
- Can animals speak or use human language?
- non-human primates such as chimpanzees.
- several experiments with chimpanzees

Experiments with Chimpanzees



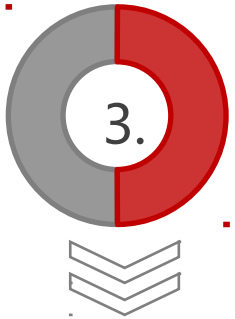
Gua

1930s
Luella and Winthrop Kellogg
able to understand about 100 words, but did not “say” any of them



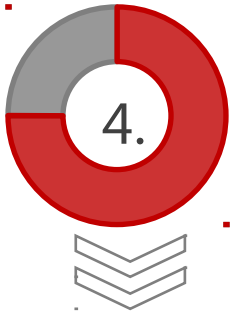
Viki

1940s
Catherine and Keith Hayes
5 years
attempting to get Viki to “say” English words by trying to shape her mouth as she produced sounds rather poorly articulated



Washoe

Beatrix and Allen Gardner
American Sign Language
3 ½ years
use signs for more than a hundred words combine them to produce “sentences”; capable of holding rudimentary conversations



Sarah

Ann and David Premack
use a set of plastic shapes
capable of producing “sentences; having capacity to understand complex structures

Lana

Duane Rumbaugh
artificial language Yerkish
(consisted of a set of symbols on a large keyboard linked to a computer)

capable of understanding and producing “sentences;

Kanzi

Sue Savage-Rumbaugh
Exposed to artificial language Yerkish while his mom was taught

•large vocabulary (> 250； thousands)

•comparable to a two-and-a half-year-old human child in comprehension

Can animals acquire human language?