



## Communication & Language: Is language necessary to think?

Michele Lanan



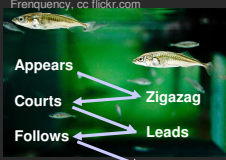
## Communication in animals



Frenquency, cc flickr.com

One animal influences the behavior of another animal, using signals

## Communication in animals




Frenquency, cc flickr.com


One animal influences the behavior of another animal, using signals

- Appears → Zigzag
- Courts → Zigzag
- Follows → Leads
- Enters nest → Shows nest
- Spawns → Trembles
- Spawns → Fertilizes

## Communication in animals



Frenquency, cc flickr.com



Ringogoingo, cc flickr.com

## Communication in animals



Frenquency, cc flickr.com



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Publicenergy, cc flickr.com

Sex, aggression, predators, food

## Communication in animals



Frenquency, cc flickr.com



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What about language?

## What is Language?

Many definitions: Linguists, philosophers explore this question

Merriam Webster Dictionary:

the words, their pronunciation, and the methods of combining them used and understood by a community

audible, articulate, meaningful sound as produced by the action of the vocal organs

a systematic means of communicating ideas or feelings by the use of conventionalized signs, sounds, gestures, or marks having understood meanings

## What is Language?

Merriam Webster Dictionary:

the suggestion by objects, actions, or conditions of associated ideas or feelings

the means by which animals communicate

a formal system of signs and symbols (as FORTRAN or a calculus in logic) including rules for the formation and transformation of admissible expressions

the vocabulary and phraseology belonging to an art or a department of knowledge

## What is Language?

Humans use language.

What are its important characteristics?

## What is Language?

Important characteristics of language

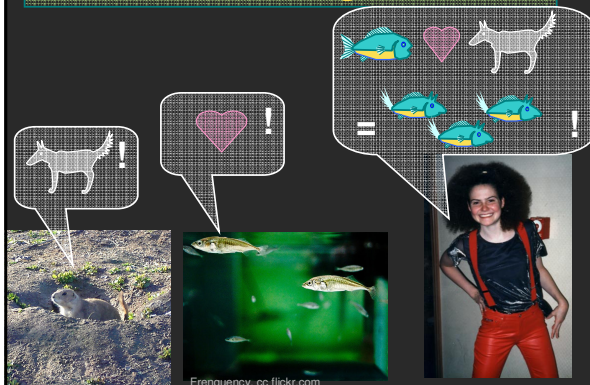
(Shettleworth 1998)

**Unbounded signal set:**  
unlimited possibilities

**Reference and Situational Freedom:**  
things that aren't here

**Communication and intention:**  
responding to the audience

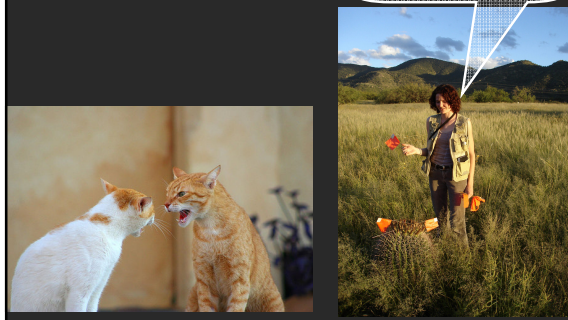
## Unbounded Signal Set



## Reference and Situational Freedom

Signals reliably refer to an idea

I'm very angry.



### Reference and Situational Freedom

Signals reliably refer to an idea  
Signal can be unrelated



Ringogoingo, cc flickr.com

### Reference and Situational Freedom

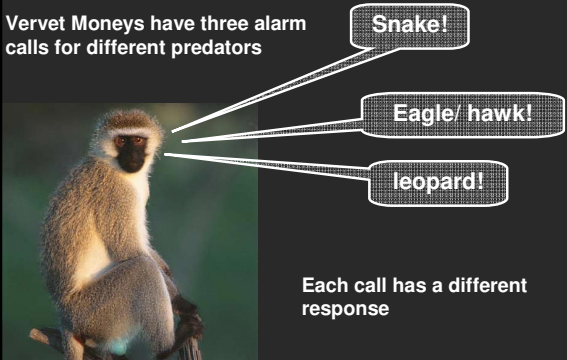
Signals reliably refer to an idea  
Signal can be unrelated  
Receiver responds appropriately



Ringogoingo, cc flickr.com

### Reference and Situational Freedom

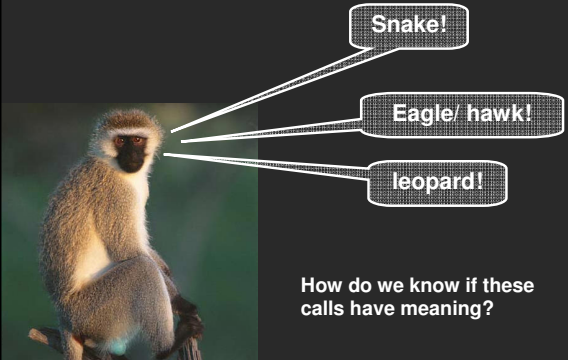
Vervet Monkeys have three alarm calls for different predators



Each call has a different response

http://www.enkosisiteexperience.com/VervetMonkeySanctuary.htm

### Reference and Situational Freedom

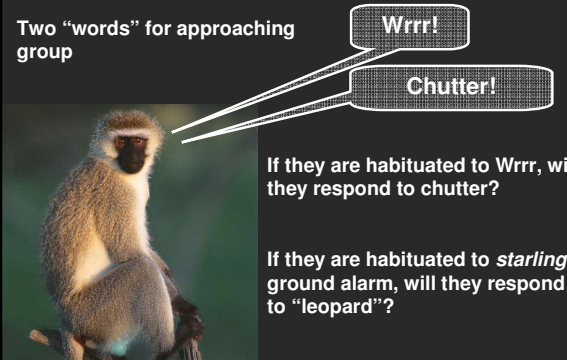


How do we know if these calls have meaning?

http://www.enkosisiteexperience.com/VervetMonkeySanctuary.htm

### Reference and Situational Freedom

Two "words" for approaching group



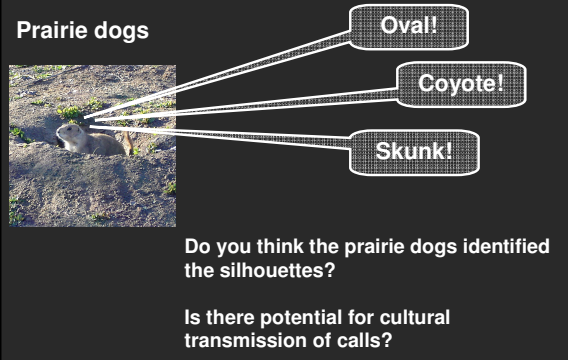
If they are habituated to Wrrr, will they respond to chatter?

If they are habituated to *starling* ground alarm, will they respond to "leopard"?

http://www.enkosisiteexperience.com/VervetMonkeySanctuary.htm

### Reference and Situational Freedom

Prairie dogs



Do you think the prairie dogs identified the silhouettes?

Is there potential for cultural transmission of calls?

## Reference and Situational Freedom

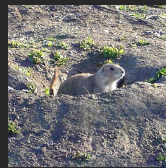
Prairie dogs



Video!

## Reference and Situational Freedom

Situational freedom or displacement



Refers to something displaced in either space or time

## Reference and Situational Freedom

Situational freedom or displacement



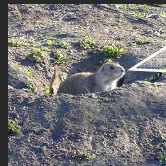
Yesterday a human followed me with a video camera!



Refers to something displaced in either space or time

## Reference and Situational Freedom

Situational freedom or displacement



Yesterday a human followed me with a video camera!



How dreadful.

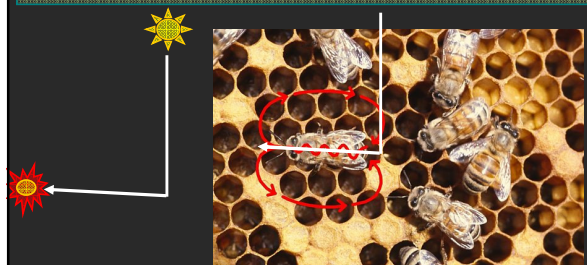
Refers to something displaced in either space or time

## Reference and Situational Freedom

Situational freedom or displacement:  
Honeybee dance?



## Situational Freedom: honeybees



Can animals lie?

## Communication and intention

Language is used with the intent of changing the cognitive state of the receiver.

Will animals respond to their audience?



Daily Wildcat

## Communication and intention

Chickens



Aerial predator!

Ground predator!

Roosters call more if they have an audience, especially if it is a hen.

Roosters use the "mother hen" food call when courting mates

## Why teach animals human language?

Snowdon (1993): ethologists are to psychologists as anthropologists are to missionaries

What aspects of language can they acquire?

Is language a general skill or a specialized module?

What does it tell us about human development and evolutionary history?

And... wouldn't it be cool to talk to animals?

## Teaching animals human language



Kelloggs and Hayes, 1930s: Gua and Viki.  
Chimpanzees do not have the equipment for spoken language

## Teaching animals human language



[http://www.personal.psu.edu/~kaz131/general\\_characteristics.htm](http://www.personal.psu.edu/~kaz131/general_characteristics.htm)

Gardners, 1969: Washoe

Learned ASL, 100+ signs

## Teaching animals human language



<http://susankukin.com/bio.htm>

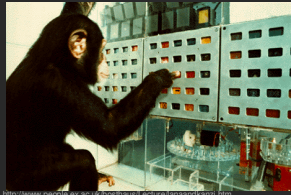
Terrace et al. 1979: Nim Chimpsky

Can chimpanzees create new sentences?

How much behavior is language, and how much is copying?

If human children also copy, why does it matter?

## Teaching animals human language



Terrace et al. 1977: Lana

Computer keyboard used for communication

Sherman and Austin also used keyboard

<http://www.geopie.ex.ac.uk/boshaus/Lecture/lanaandkanzi.htm>

## Teaching animals human language



Savage-Rumbaugh et al. : Kanzi the Bonobo

Learned English (similar to a 2-year old human)

Learned the keyboard from his mother.

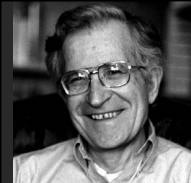
<http://www.people.ex.ac.uk/boshaus/Lecture/lanaandkanzi.htm>

Why don't language abilities progress, as they do in human children?

## Human Language

Does human language reflect general learning ability? (Skinner)

Or- do we have a specialized language module? (Chomsky)



[www.noam-chomsky.com](http://www.noam-chomsky.com)

Univ. Pennsylvania & Harvard. Teaches at MIT.

Generative grammar: a rule set for a language.

Politics: authority is illegitimate until proven otherwise.

*Sneaky Who's Who:*

**Noam Chomsky**

<http://www.chomsky.info/>

Linguist- studied language in humans. Hypothesized that children are born with an innate "Universal Grammar." All that is necessary for language acquisition is vocabulary and parameter settings.

*References:*

*Logical Structure of Linguistic Theory (1955, 1975)*

*Syntactic Structures (1957)*

*1965. Aspects of the Theory of Syntax (1965)*

*Topics in the Theory of Generative Grammar (1966)*

*Studies on Semantics in Generative Grammar (1972)*

*Language and Thought (1993)*

## Is language necessary to think?

What do we mean by 'think', anyway?

Do you always use language when thinking?

## Amanda Baggs: Autism, language, and thought



<http://ballastexistence.autistics.org/?cat=40>

"low functioning"

## **Amanda Baggs: Autism, language, and thought**

“My viewpoint in the video is that of an autistic person. But the message is far broader than autistic people. It is about what kinds of communication and language and people we consider real and which ones we do not. It applies to people with severe cognitive or physical disabilities, autistic people, signing deaf people, the kid in school who finds she is not taken seriously as a student because she does not know a lot of English, and even the cat who gets treated like a living stuffed animal and not a creature with her own thoughts to communicate. It applies to anybody who gets written off because their communication is too unusual.”