


## Agenda Week 3

- Language and Cognition
  - > If animals think, and if thinking is silent language  
--> animals have language
- Do some animals process words and phrases using the same kind of language mechanisms that humans use?
  - > Alex's language-like behavior 
  - > Overview of Ape language research
  - > How to tell an animal who actually knows (human) language from a fake?

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## Ape and Chimp Celebrities



Koko and Penny Patterson



Nim Chimpsky and Herb Terrace



Kanzi



Washoe and Deborah Fouts

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## Why study whether apes can learn human language?

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- At first (1930 to 1980): To prove that language is a behavior like any other that can be taught using operant principles of reward.
- Then (1980 to 1990): To prove that language is an outgrowth of cognitive development which actually means to prove that language is not innate.
- And now, in addition, to prove that animals can think.

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## History 1930-70 Speech Teaching

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- Two teams of psychologists tried to raise chimps as human children at home.
  - Gua was raised with a boy and treated as a sibling by her adoptive parents
  - Vicky was raised as an only child by adoptive parents who gave her “speech lessons”
- Both failed to learn to speak words
  - Gua never said a word, understood 100
  - Vicky made 3 word-like utterances
- Speech (output) as the only sign of language

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## History 1970-80

### Non Speech-Language Teaching

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#### ■ Caged interactions

- Sarah learned to associate plastic shapes on a board with objects and actions (Premack)
- Lana learned to associate computer buttons (lexigrams) with objects and actions (Rumbaugh)

#### ■ Natural interactions

- Washoe raised like a child with grad students teaching her ASL (Gardiner)

#### ■ All failed to learn much.

- Sarah and Lana learned many (>100) lexigrams
- Washoe learned maybe 75 word-like signs that mostly indicated what she wanted

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## History 1980-

### The Plug is Pulled


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- **Nim Chimpsky**- taught ASL by an experienced teacher (Terrace)
- **Koko**-taught ASL by an inexperienced teacher (Patterson)
- **Kanzi**- a bonobo (pygmy) chimp raised by a subject of a chimp-language study, taught both computer language (lexigrams) and English (Rumbaugh)
- Varied results
  - > Nim Chimpsky ◻
  - > Koko. ■
  - > Kanzi. ■

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## Nim Chimpsky

- After 4 years, Nim learned 125 signs and combined them into 2 or 3 word utterances.
- The addition of a 3rd word didn't add to the sentence but were simply repetitions. Word order varied.
- Terrace concluded:
  - > 12% of Nim's signing was spontaneous.
  - > Almost 80% of was in response to prompting
  - > 40% was repetition of signs made by his trainers.
- Results spelled doom for federal research funding 

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## Transcript of Koko's 1998 webchat

Begin Transcript:

HaloMyBaby: Welcome, Dr. Patterson and Koko, we're so happy you're here!

DrPPatrsn: You're welcome!

HaloMyBaby: Is Koko aware that she's chatting with thousands of people now?

LiveKOKO: Good here.

DrPPatrsn: Koko is aware.

HaloMyBaby: I'll start taking questions from the audience now, our first question is:

MInyKitty asks Koko are you going to have a baby in the future?

LiveKOKO: Pink

DrPPatrsn: We've had earlier discussion about colors today

LiveKOKO: Listen, Koko loves eat

HaloMyBaby: Me too!

DrPPatrsn: What about a baby? She's thinking...

LiveKOKO: Unattention

DrPPatrsn: She covered her face with her hands....which means it's not happening, basically, or it hasn't happened yet.

LiveKOKO: I don't see it.

HaloMyBaby: That's sad!

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## Koko Continued

DrPPatrsn: In other words, she hasn't had one yet, and she doesn't see it happening. She needs several females and one male to have a family. In our setting it really isn't possible for her to have a baby.

HaloMyBaby: Do you see that situation changing when you get the Gorilla preserve on Maui?

DrPPatrsn: Yes, we do.

LiveKOKO: Listen.

DrPPatrsn: Koko wants to hear on the phone as we're doing this.

HaloMyBaby: Hi Koko! I can hear her! She breathed at me! This is so cool! In case you're curious, here's how Koko is able to participate in this chat: Dr. Penny Patterson is signing the questions to Koko from the online audience and a typist is entering for her.

DrPPatrsn: I'm working to create a family. In Hawaii, we'll have the ability to do that she's almost assured to have a family of her own.

HaloMyBaby: So she really is looking forward to this!

DrPPatrsn: She's making happy sounds now...

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## Kanzi

- On first day of training, Kanzi knew several lexigrams
- By 17 months, vocabulary of 50 lexigrams, combining them following an action-object pattern: *give banana*. About 90% were spontaneous and about food and comfort.
- Lexigram and pointing strings used to indicate some other agent or recipient of an action such as *(you) tickle* or *chase (you)*.
- Could interpret strings of English words such as “pour the milk on the cereal” at 75% accuracy with no formal training. No clear evidence that interpretation was based on sentence structure rather than guesses based on word meaning.
- Interesting finding: “Go to the group room and get the ball” incorrect but “Get the ball that’s in the group room” correct.

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## Like animals or humans?

- **Aspects like animal communication**
  - Like bird calls, signs/lexemes senselessly repeated
  - Usually directed toward food and comfort
    - 96% of Kanzi's messages are for food and comfort
  - Many signs are like those used in the wild (Goodall)
  - No turn taking, over-signing, no listener perspective
- **Aspects unlike human language**
  - Words and phrases have loose meanings -- toothbrush = toothpaste, brush teeth, time for bed, shut off light.
  - No indication of a complex words or structured grammar (except for Kanzi's results)

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## Chimps just don't get it

- **Humans use language to convey the ideas contained in their minds**
  - Provide a current and ongoing report of the products of reasoning
    - a series of “Here's what I think, here's what I think, here's what I think ...”
  - Naturally motivated to share contents of their minds across a virtual reality network of minds
    - Mindreading the listener and adding new information.
    - Much like severely autistic children don't mindread and don't use language normally
- **Animals use trained responses to get what they want from humans**

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