

# Mimesis



## *Homo imitans* \*

- A hominid specialization!

\* Meltzoff 1988



- But, observe many types & functions of imitation across the phyla . . .

# Types of Imitation

## Built in

### Structural:

e.g. Eyespots that fool predators; Human breasts that appear milk-rich



### “Contagion”

Behavioral, involuntary: e.g. Yawning, chickens pecking, babies crying



## Types of Imitation

### Stimulus Enhancement

- Activity by Model draws attention of Observer to context/object
- Observer then *appears* to mimic, engaging in species-typical behavior and/or learning on its own

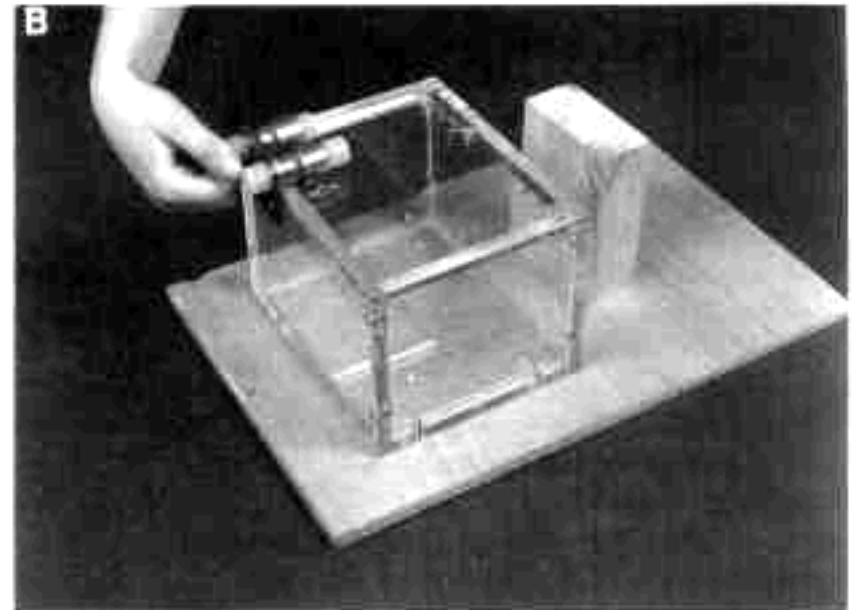
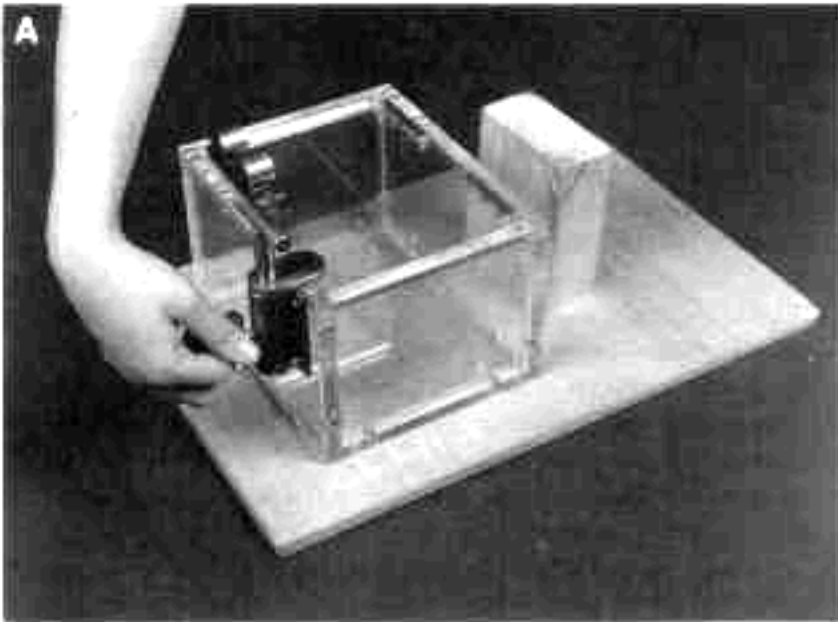


e.g. Blue Tits drinking  
from milk bottles

## Types of Imitation

### Emulation

Observer mimics outcome (“goal”),  
rather than means of attaining it



- Most common NHP response to “Artificial Fruit”
  - Puzzle Box: Experimenter models different options for opening
  - NHP less likely to imitate observed option than human
    - They just “get it open”

## *Types of Imitation*

### **Delayed Imitation**



Imitation that occurs in  
absence of model

In nonhumans, only after individual  
practice in presence of model

In humans, can see novel imitations  
first appear in absence of model

## *Types of Imitation*

### **“True” Imitation**



Duplication shows high fidelity and novelty  
i.e. Immediate mimicry of new behavior

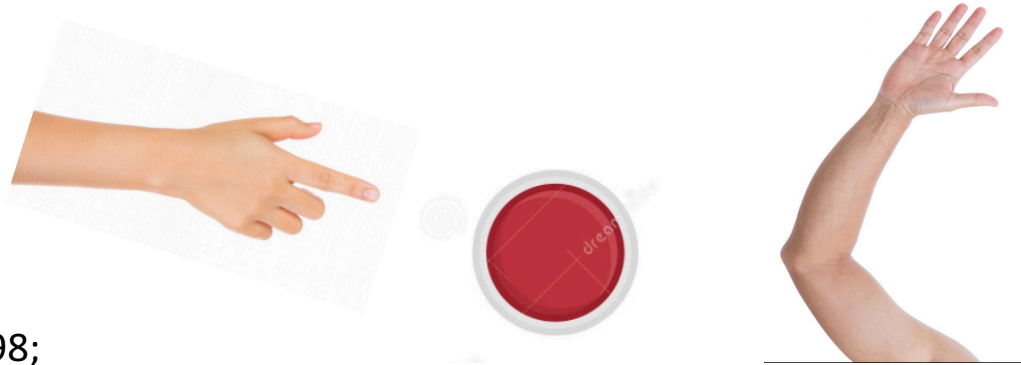
Also involves attending to & copying  
means (not just outcome)  
that other uses to accomplish X



# Types of Imitation

## “True” Imitation

- e.g. Child copies exact odd moves (e.g. press button with elbow)
  - So, slavishly copy, default to “presumption of utility”, even if do not immediately understand function



See Carpenter et al 1998;  
Gergely et al 2002

- Unless see Model’s state (e.g. hands full, accident) not afford normal action > emulate instead

### NOTE:

- While “True” Imitation could be translated as “Human” Imitation, humans actually do ALL of the above!





## *Types of Imitation*

- Plus, humans show **VOCAL imitation**
  - Of one another and of environmental sounds
  - Common in some birds, but rare in mammals, including NHPs (except dolphins)



# Functions of Imitation

## Co-Action

- Eat when group eats, flee when group flees, etc.



- Advantages for food finding, predator avoidance



# Functions of Imitation

## Promotes Prosociality

- “The sincerest form of flattery”
- After being imitated, humans are nicer, even to third parties
  - e.g. *von Baaren et al 2004; Carpenter et al 2013*



Tend to imitate the powerful,  
the admired

# Functions of Imitation

## Learning

- By engaging in observed behavior, can learn affordances, accomplish new ends



# Functions of Imitation

## Conventionalization of Behavior

- Develop group-specific traditions, passed on across generations



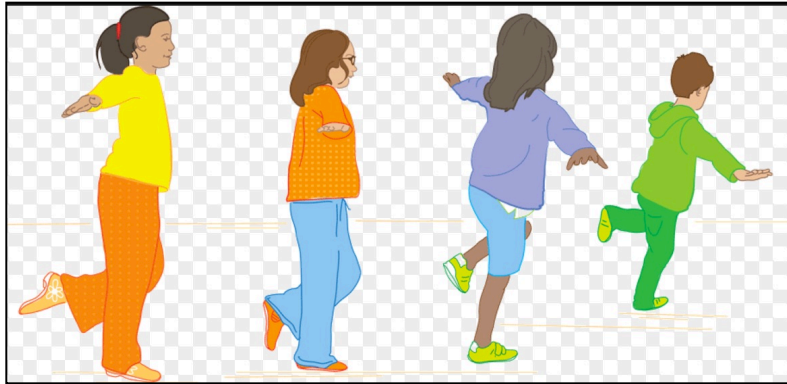
- Including in some nonhumans



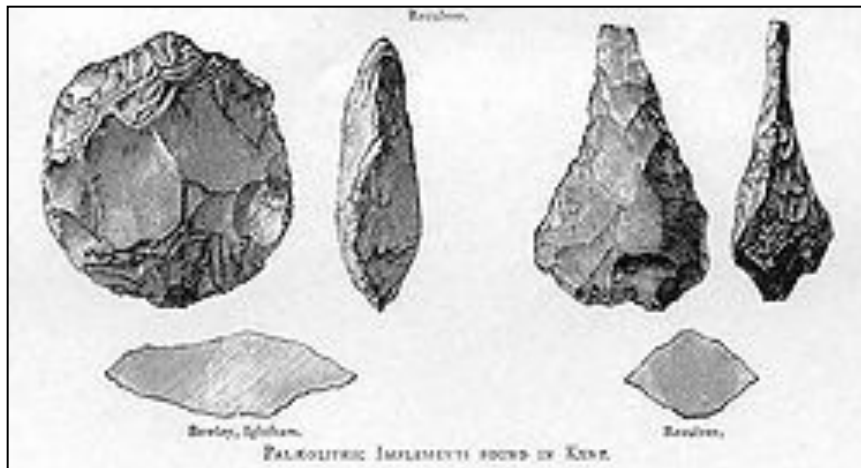
# Functions of Imitation

## Conventionalization of Behavior

- Tends to establish a conformist stability



Which in turn promotes  
in group/out group distinctions



- Perhaps helps account for 1MY stasis of Acheulian tools?

# *Functions of Imitation*

## **Communication**

### **“Mimesis”**

- Includes iconic gesture, pantomime, teaching, etc.



More to Come, below...

# Entrainment

- Synchronize with and duplicate (vocal, haptic, body, etc) output of others





# Entrainment

Common in many animals,  
but more elaborate, flexible  
in humans



# Entrainment

**Sing** especially in unison, same or complementary



A bonding  
behavior

Note some NHPs “sing”,  
but limited.



# Entrainment



- Dance
- To music, drumming



- Done socially, as ritual, as entertainment, etc.



# Entrainment

We exhibit some cognitive advantages from entrainment



- e.g. Easier to maintain a heard (vs self generated) rhythm

# Entrainment

We exhibit some cognitive advantages from entrainment

- e.g. Easier to remember linguistic code if done in “sing-song”
  - Rhythmic
  - Rhyming
  - Collaboratively learned
- These are all mnemonic!



# Entrainment

Singing Together Coordinates Effort

**PRISON WORK SONGS**  
— mixtape —



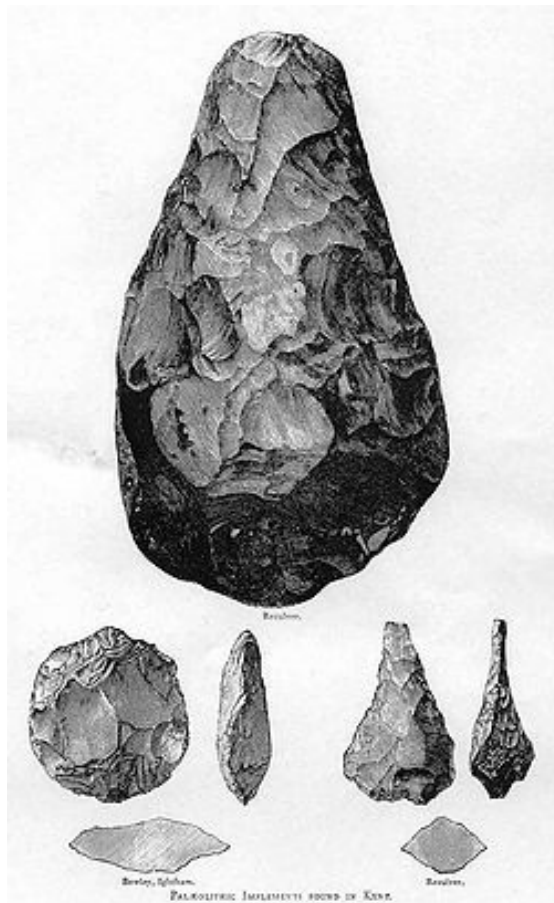
# Entrainment

- Vocal rituals also used to socially-coordinate (control) Breathing?!



# Entrainment

- Possibly interactions between vocal/haptic rhythms and tool construction and/or use??





# Gesture

A related nonverbal communication skill

Primates develop gestures



Humans gesture more & more flexibly



# Gesture



Typically accompanies and supports or complements speech



We can still also communicate much without speech

# Gesture

Many types including...

## **Emphatic**



Typically large, rhythmic, non-specific movements that add emphasis

Probably a function of generalized arousal and link between hands & mouth

# Gesture Indexical



For directing attention

- Includes **Pointing**
- Not seen in NHPs

(See Lecture 9)



# Gesture

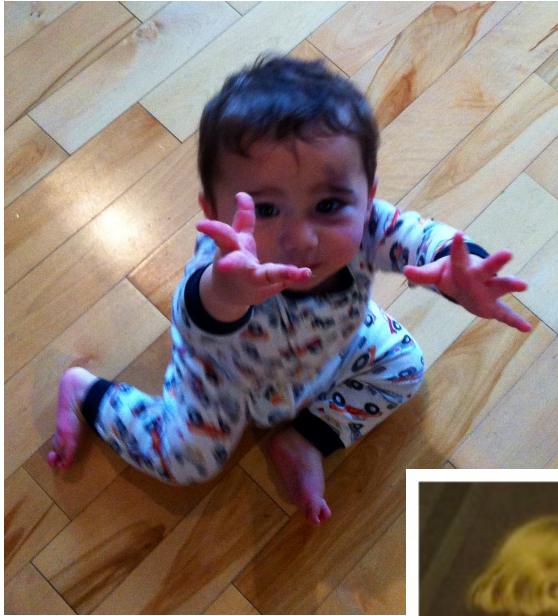
## Iconic



Iconic gesture is  
*analogue* –  
physically congruent  
with that which  
it represents

# Gesture

Imitate our OWN role...



**Iconic**

Includes “handling” of  
absent objects



Imitate  
ANOTHER'S  
role...



“Pitcher”

# Gesture

## Iconic

Can include changes of scale,  
and mappings to various  
body parts



# Gesture

## Conventional

Culturally-agreed meaning



Many of these derived, modified, from Iconic



# Gesture

## Conventional



A historic (vs. evolutionary) development



Signals become  
**increasingly arbitrary**

Humans use gesture in a variety of ways...

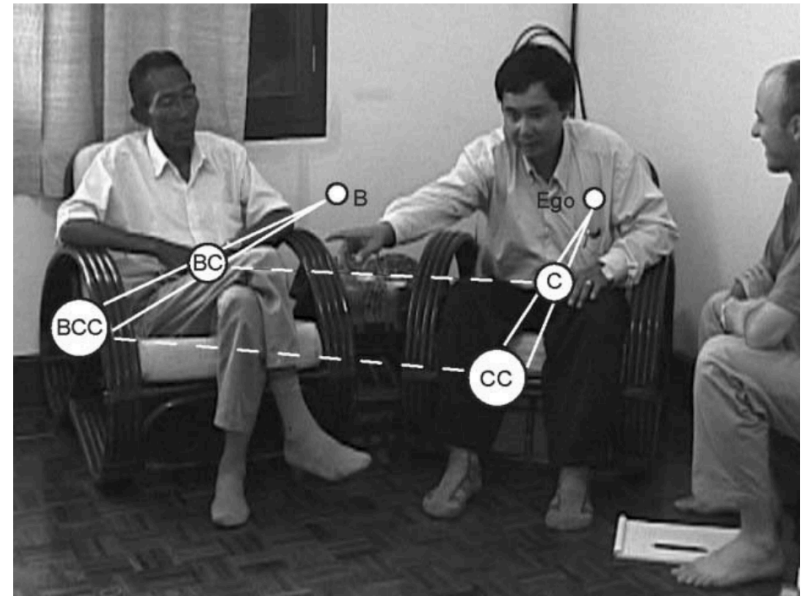
Many are **“Environmentally-Coupled”**



Show or otherwise incorporate objects into communication,  
especially cognitive (info-relevant) artifacts

Humans use gestures in a variety of ways...

## Staging a Frame



- Establish a temporarily meaningful space, to index, use spatial metaphors, etc
  - i.e. Create a shared, invisible reality.
  - Does this cognitively require symbolic speech???

# Evolution of Gesture

- While gesture is older than speech,  
did a formal “Sign Language” precede spoken language???
- **PRO**: Emerging structure of narrative (see below)  
may have standardized patterns of use
- **CON**: Hands often otherwise busy when people gathered  
(carry, cook, eat, make tools, etc.)

# Mimesis – Using Imitation to Communicate

## Pantomime + Vocal

(Theater, Charades)

- “Act As If” = a type of simulated reality, performed for others
- Universal, practiced and understood around the world;
  - Brain areas (STS, Mirror sys) closely linked w/speech
- Contemporary humans often “act out” voices, attitudes, actions of others as tell stories



# Mimesis – Using Imitation to Communicate

- **Iconic** relationship to referent highlights information for observers re even absent entities, actions, events
- Requires **combinatorics** – organizing bits of experience into new, communicative sequences
- Requires **self control** – e.g. to produce emotions not currently felt, acts not currently efficacious
- Acting “as if”; Involves conceptual “counterfactuals”, multiple realities, im/possible worlds
- Overall, requires tolerance of the unreal, co-existence of multiple realities (vs. normal rejection of violations)
  - e.g. See also *Bateson (1972)*; *Leslie (1987)*; *Perner (1988)*; *Gomez (2008)*

## **Mimesis (“Act as if”)**

- Provides creative & elaborate responses to a variety of hominid challenges
  - **Deception**
  - **Pretense**
  - **Teaching**
  - **Narrative**

# *Adaptive Functions of Mimesis*

## Deception

Many mechanisms for deception across phyla

- Structural: Eyespots on butterflies
  - Exploits that large eyes predict large teeth



- Involuntary: Some fireflies flash like other species
  - Works to attract & eat them





# *Adaptive Functions of Mimesis*

## **Deception**

Many mechanisms for deception across phyla

### Learned:

- Primates may hide from dominant male's sight to mate uncontested
  - Thru experience w/past harassment, check for dominant's attention, since others have a tendency to face where they go/do.



## *Adaptive Functions of Mimesis*

Can become quite elaborate in humans, via

### **Mimesis**



## **Deception**



“Acting as if” includes acting in a way that is consistent with a reality that you know is not the case



# *Adaptive Functions of Mimesis*

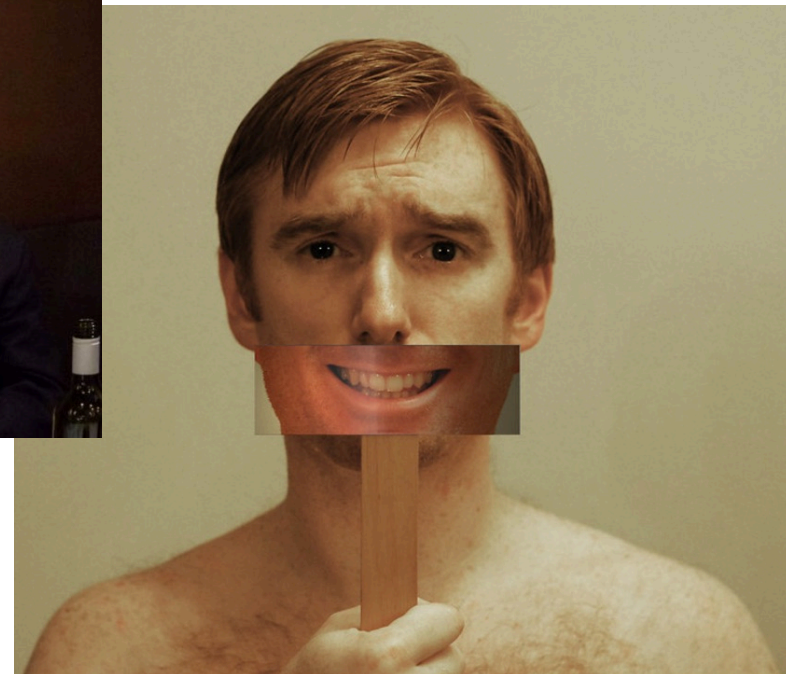
Can become quite elaborate in humans, via

## **Mimesis**



## **Deception**

Convey information, attitude that is  
more conducive  
(than the truth)  
to a desired outcome



# *Adaptive Functions of Mimesis*

Can become quite elaborate in humans, via

## **Mimesis**

To do this well, need to learn about what others can/not know



See upcoming Lecture 9

## **Deception**

Can exploit the ignorance of others

e.g. if they were absent from original event



Deception can select for better counter-deception, which selects for better deception, etc. etc.

## Deception

Includes evolution of  
*Self-Deception* ?

Can reduce ambiguity of signals,  
since less work required  
to suppress contradictory signs.

Can make you a  
more effective deceiver  
of others.

See Von Hippel & Trivers, 2011



## Pretense

- Often involves Novice imitating - even absent – Expert
  - Practice of observed cultural activities



## Pretense

- Often collaborative,  
with specific roles w/characteristic behaviors, relationships



# *Adaptive Functions of Mimesis*

## **Pretense**

Can also involve innovation, experimentation,  
in relatively safe context of play





## Pretense

Can involve “transformation” of objects

- e.g. Pretend that block is telephone (see Leslie 1987)



- Requires simultaneously recognizing that a block is a block, and it is also a phone
  - Tolerate real + unreal

# Functions of Imitation

## Teaching



- So, not just Novice imitates, but Teacher imitates
- When demonstrates
- When repeats/corrects error

# Functions of Imitation

## Teaching

Nonhumans: Do as you do

Hominids: Do as I do



More to come! (See Lecture 9)



# Narrative



# Pantomime

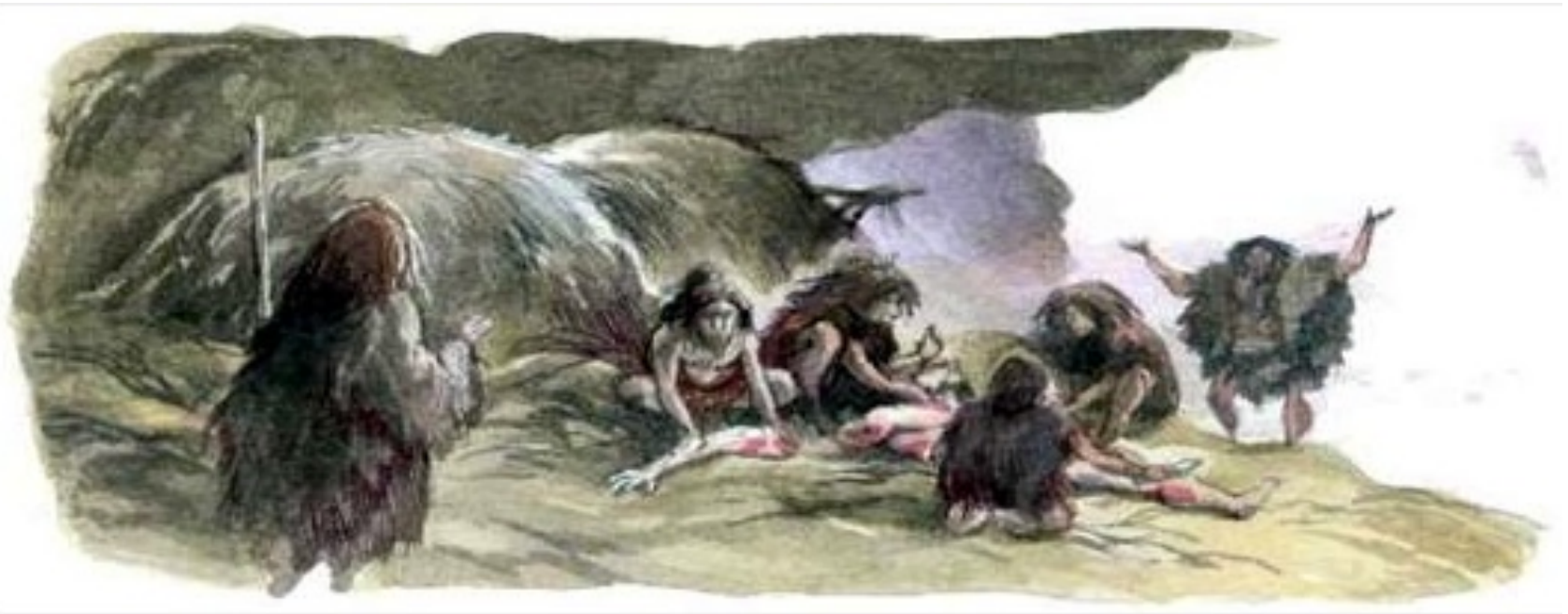
Acting as if . . .

**NARRATIVE -**  
Perhaps first via  
"acting out" an event?!



# Narrative

- Can be used to **inform** ignorant others
  - Who were not present at event
    - e.g. Past events of significance
    - e.g. Prey, food availability
    - e.g. Gossip



# Narrative

Who did what to whom, with what, where & when?



Notice that these are SYNTACTICAL categories!

# Narrative

## Explanation

- Only humans ask (and try to answer) Why?
  - i.e. Integrate capacities for narrative & attribution of motive
    - >> explain behavior, events



# Narrative

## Parable & Myth

- Eventually develop parables & myths,
  - Religious accounts to explain mysteries of world
- **Embody** complex, abstract concepts at **human-scale**





# Narrative



- Just how much of above is possible with iconics vs. arbitrary symbols???
- At least established a cognitive substrate that evolution could further operate on >> speech