

# Tool use

*Definitions and their problems*

## Definitions of learning, social learning, etc.

*Discussion can be endless – what to do?*

- Maybe there is no good definition
- Concentrate on the phenomenon
- Decide what your question is: mechanism, evol. function, ecol. consequences
- Be careful not to imply a mechanism if the mechanism is not known

*Social learning*

## Culture

- Definition: socially transmitted behavior across generations
- Creates population differences in behavior



*Social learning*

## Culture

**Evolutionary function: locally adapted food acquisition; behavioral flexibility**

**Ecological consequence: population differences in behavior**

**Mechanism: unknown**

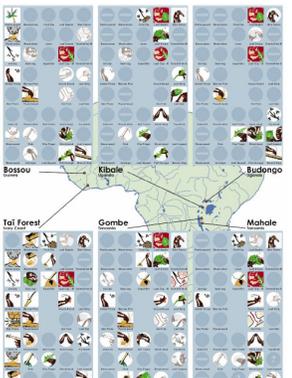


*Tool use*

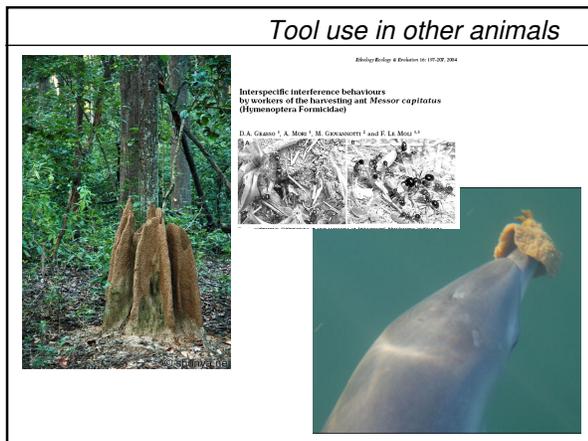
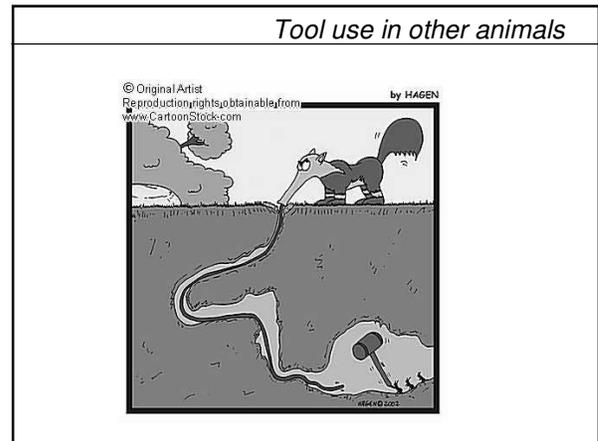
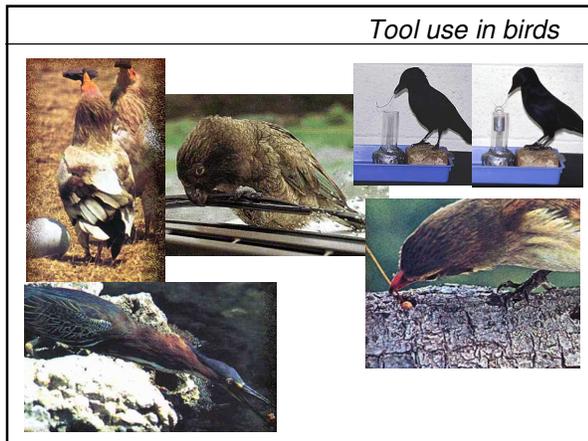
## Tool use and what it means (?)

video 1  
video 2

*Tool use in chimps*



- Investigatory probe (probe and sniff)
- Play start (invite play holding stem in mouth)
- Crab branch (drag large branch in display)
- Leaf-sponge (leaf mass used as sponge)
- Branch-clasp (clasp branch above, groom)
- Branch-shake (to attract attention, court)
- Buttress-beat (drum on buttress of tree)
- Nasal probe (clear nasal passage with stick)
- Comb (stem used to comb through hair)
- Insect sound (probe used to make insect)
- Resin-pound (extract resin by pounding)
- Branch-hook (branch used to hook branch)
- Perforate (spud stick perforates termite nest)
- Dig (stick used as spade to dig termite nest)
- Blunt-stick (probing stick with blunt end)
- Spas-stick (stick protection from thorns)
- Shopping-stick (walking on sticks over thorns)
- Container (object used as container)
- Leaf-knip (leaves used to mop up insects)
- Leaf-wipe (food wiped from skull etc.)
- Leaf-brush (leaf used to brush away bees)
- Open and probe (perforate, then probe)
- Sponge push-pull (stick and sponge tool)
- Algae-scoop (scoop algae using wand)
- Ground-high-nest (high-nests on ground)
- Anvil-prop (rock used to level anvil)
- Food-pound onto wood (smash food)
- Food-pound onto other (such as stone)
- Nut-hammer, wood hammer on wood anvil
- Nut-hammer, wood hammer on stone anvil
- Nut-hammer, stone hammer on wood anvil
- Nut-hammer, stone hammer on stone anvil
- Nut-hammer, other (such as on ground)
- Restle-pound (mash palm crown with pebble)
- Club (pounce forcefully with stick)



*Tool use*

**Examples**

- Chimpanzees: several different tool use traditions
- Other primates & apes
- Birds: crows, ravens, woodpecker finches, green herons, keas, egyptian vultures...
- Insects? Ants?

*Tool use*

**Tool use**

- Mechanism: could be innate, learned by trial & error, socially acquired (by copying or just stimulus facilitation etc.), or strategy arrived at by 'insight' (= 'causal reasoning') – or a combination
- **Ecological/evolutionary consequences:** complex food extraction skills; if learned, adaptability to new niches; fine motor skills become more important; evolution of large brains?

*Summary*

**Tool use**

- Clearly some cases of tool use that are likely innate, evolved strategies
- Clearly some tool use that is learnt & improved with experience
- Some tool use is learnt better in the presence of demonstrators
- Tool use can cause differences in foraging methods (and success?) between groups

### **Tool use**

- Is this different from associative learning?
- Does a tool-using animal 'understand' why the tool works?
- What would it mean if only parrots and primates were capable of such 'insight'?
- Does using materials/objects to achieve a goal enable animals to conquer more niches?