

Tool use

Definitions and their problems

Definitions of learning, social learning, etc.

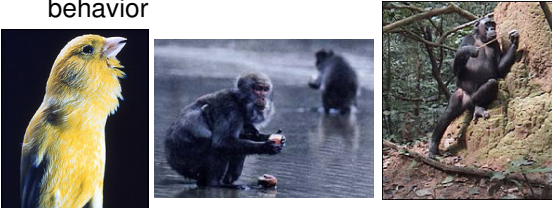
Discussion can be endless – what to do?

- 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



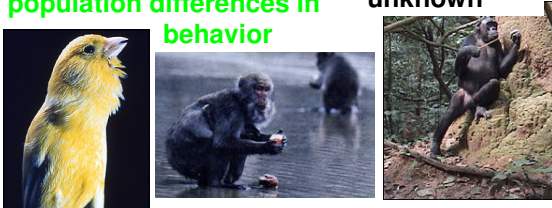
Social learning

Culture

Evolutionary function: locally adapted food acquisition; behavioral flexibility

Ecological consequence: population differences in behavior

Mechanism: unknown

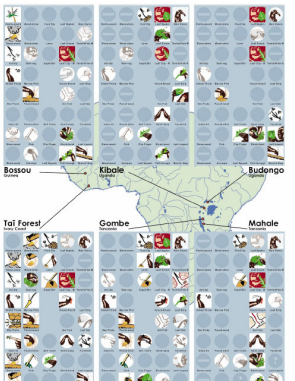


Tool use

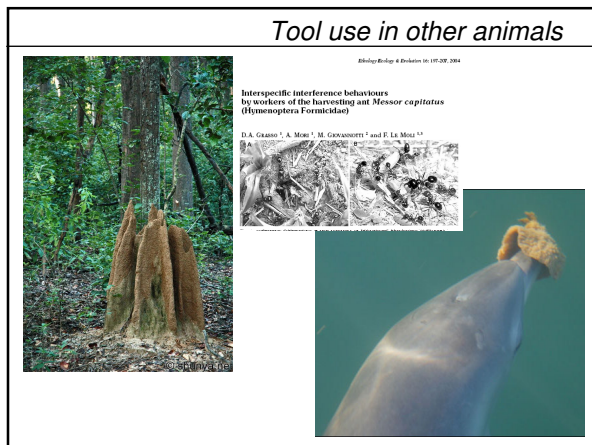
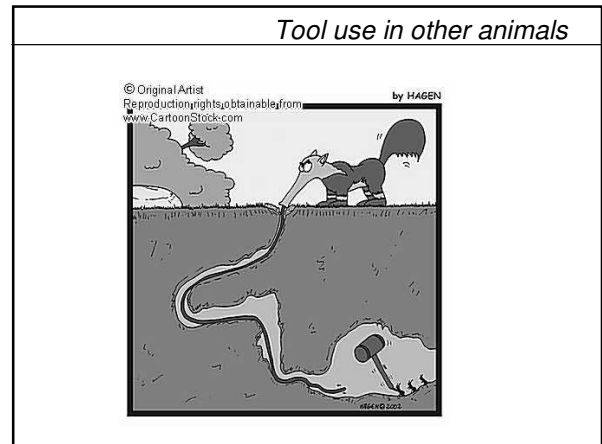
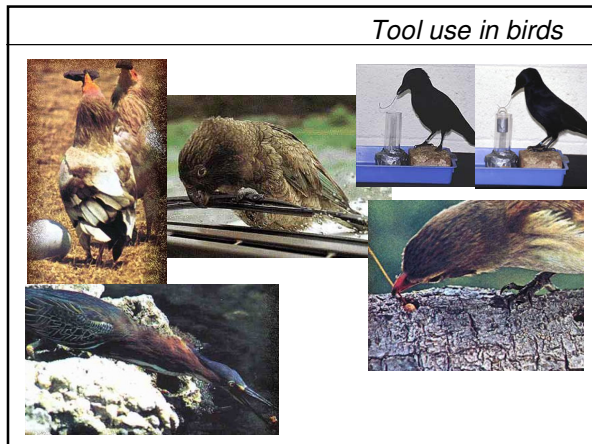
Tool use and what it means (?)

video 1
video 2

Tool use in chimps



Investigatory probe (probe and sniff)
 Play start (invite play holding stem in mouth)
 Drag 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)
 Perfume (spoil 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-mop (leaves used to mop up insects)
 Leaf-wipe (food wiped from skull etc.)
 Leaf-brush (leaf used to brush away bees)
 Open and probe (peel/force, 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)
 Pestle-pound (mash palm crown with pestle)
 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?