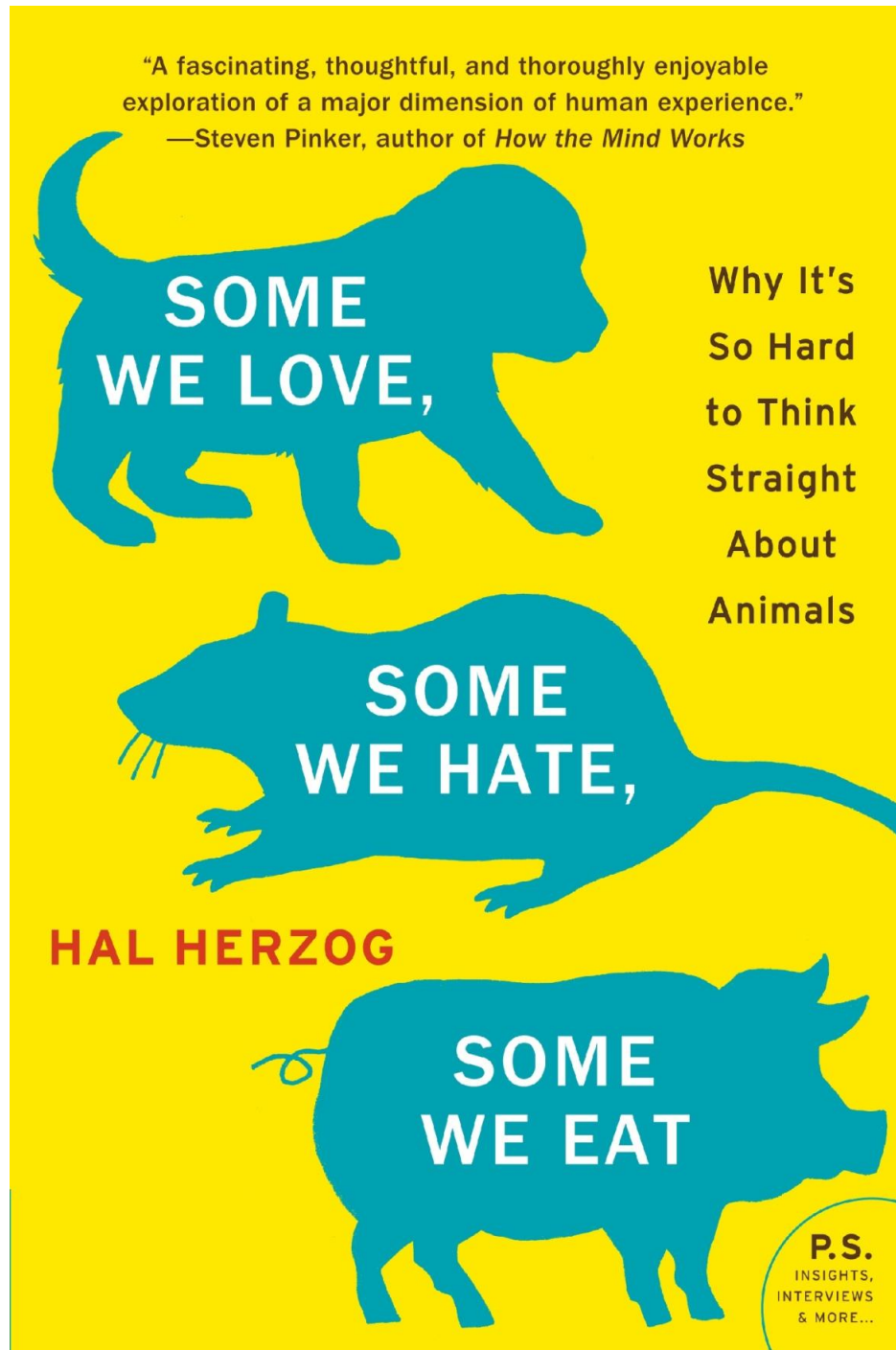
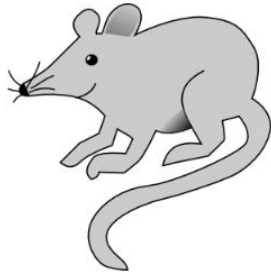


Instructor Resources for



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A Some We Love, Some We Hate, Some We Eat Instructor's Resource



Classroom Discussion: Animal Research

I often use scenarios to encourage students to discuss ethical issues. The students divide themselves into groups of between five and seven students. I ask one student to be the group leader. In this case, each group is a university *Institutional Animal Care and Use Committee (IACUC)*. According to the federal Animal Welfare Act, IACUCs are charged with approving or rejecting research projects that will involve animal subjects.

The leader reads the scenario (a research proposal) to the group members and leads a discussion of the ethics of the proposal. I encourage the groups to discuss the pros and cons of the study and try to reach a consensus rather than taking a quick vote. Among the factors the students should consider are: what will be gained by the experiment, will the research potentially lead to a cure for human diseases, and will it answer an important scientific question. The students should also consider the degree of harm or pain and suffering that the study will involve.

Depending on the time available, I give each group one or two proposals to review. Once they make their decisions, I ask the group leaders to come to the front of the room and briefly describe the study to the rest of the class. They report their group's decision to approve or reject the research and their reasons for making it. At this point, other students in the class can also weigh in on the proposed research. Often, groups will make different decisions for the same proposals. All of these proposals are based on real cases.

Case 1. Stem Cell Transplantation (Monkeys)

Your group is the IACUC at Southwestern University. Professor King is working in a new and exciting research area of science, brain grafts. Embryos contain a special type of cell (stem cells) that have the capacity to become any type of cell including neurons. Could embryonic stem cells be implanted into adults who have suffered brain damage? And would these cells develop into neurons that make the proper connections and repair the damage? Dr. King wants to transplant stem cells from monkey embryos into the brains of adult monkeys, specifically into the entorhinal cortex. In humans, this area

is involved in Alzheimer's disease.

He proposes to use 20 adult rhesus monkeys as the subjects. First, all the monkeys will be subjected to surgery in the entorhinal cortex. This procedure will involve anesthetizing the animals, opening their skulls, and removing part of the brain. After they recover, the monkeys will be tested on a learning task to make sure their memory is impaired. Three months later, half of the animals will be given transplant surgery. Monkey embryonic stem cells will be implanted into the entorhinal cortex of the brain damaged monkeys in the experimental group. All the animals will then be taught a new task to test the hypothesis that the animals with brain grafts will show improved memory and perform better than the monkey in the control group that did not get the stem cells.

Dr. King argues that this research is in the exploratory stages and can only be done on animals. He notes that over five million Americans have Alzheimer's disease. He says that this research could lead to treatments that would reverse the devastating memory loss that human Alzheimer's victims suffer.

Approve or disapprove?

What are your reasons?

Case 2. The Neurobiology of Instincts (Mice)

Your group is the IACUC of Southeastern University. Dr. Fentress is investigating one of the oldest issues in psychology - the nature-nurture issue (learning vs. instinct). He studies the degree that complex behaviors are under genetic control. He wants to investigate the complicated series of movements mice use to groom themselves. Some researchers argue that this sequence of behaviors is learned. They think mice teach themselves the grooming movements by repeating behaviors that just happen to get rid of dirt. Fentress, in contrast, believes that grooming in mice is a clear example of an instinct. He believes these behaviors can develop with no practice or experience. He thinks that the grooming movements are genetically "hard-wired" into the brain from birth.

Fentress has designed an experiment to test which of these theories is correct. He proposes to deprive newborn mice of the opportunity to learn the grooming behavior patterns by amputating their forelimbs, leaving short stumps. Twenty animals will be used in the experiment. The 10 animals in the experimental group will be anesthetized the day after they are born and their front limbs painlessly amputated. The 10 animals in the control group will be temporarily anesthetized but their limbs will not be amputated. All the animals will be hand-reared by humans so that they will not have the opportunity to learn the behaviors from their mothers. The mice will be observed on a regular schedule using standard observation techniques. Any grooming movements will be filmed and analyzed.

If grooming is a learned behavior, the animals in the experimental group should not

make grooming movements with their stumps as they would have no effect on removing dirt. However, if the grooming movements are instinctive, the animals should exhibit grooming movements with their stumps at the same age that they appear in the control group mice.

In his proposal, Dr. Fentress notes that understanding the genetic basis of mouse behavior cannot be directly applied to humans. However, he argues that the experiment will resolve an important debate over existence of instincts in mammals that is related to humans. He also argues that the study will shed insight in to the role of genes in brain development. Finally, he stresses that the amputations are painless, and the animals will be well-treated after the operation.

Approve or disapprove?

Reasons for your decision?

Note – this study was actually done and the students will be interested in the results. (But don't tell them until after the groups have made their decision.) The amputee mice did make grooming movements with their stumps, proving that the behaviors were instinctive.

Case 3. Inter-Species Heart Transplantation (Chimpanzee)

Your group is the IACUC of Eastern University Medical School. A thorny proposal has come before your committee. Dr. Baker is a world renowned heart surgeon. While healthy human hearts can successfully be transplanted into the body of a person with heart disease, there is a severe shortage of healthy hearts. Thousands of people each year die because they could not get on the list to receive a human heart. Dr. Baker has tried to develop an artificial heart. Unfortunately, these have not work for more than a week in a human. He now wants to try transplanting an animal heart into a terminally ill human. He notes that some animal parts are already used to repair human hearts. For example, pig heart valves are commonly used to replace damaged valves in human hearts. A California surgeon has tried implanting a baboon heart into a young child. The heart worked for about a week before the child died. Baker feels that a chimpanzee heart would be much more likely to produce a successful result because chimps are much more closely related to humans than baboons. Nearly 97% of our genes are identical to those of chimps.

He proposes to implant the heart from a three year old healthy male chimpanzee into the chest of Fred Jones, a 68 year-old man who is dying of heart disease. Mr. Jones will almost certainly die within two months if the transplantation experiment is not performed. He has been informed that the procedure is very risky and that he may die or have a reduced quality of life following the surgery. He has also been informed that the procedure is entirely experimental. Mr. Jones has agreed to the surgery. He says he is doing it not to extend his own life but to advance science so that in the future, others might benefit from receiving chimpanzee hearts.

Dr. Baker argues that this experiment, even if unsuccessful, will be of ground-breaking importance and lead to the development of technologies that will permit the use of animal organs to replace defective human body parts. Millions of lives each year can be saved, he says, if humans could receive animal hearts.

Your group needs to approve or reject the project from an animal care perspective. (The human subjects committee will review the human ethics aspect of the research.)

Approve or reject?

What is your reasoning?

Note – A proposal exactly like this one did come before the IACUC of a major university medical center. After months of deliberation, the committee rejected the experiment on animal ethics grounds.

Case 4. Animals in Education - Anatomy Class Dissection (Cats)

Your group is the IACUC of Northern University. An unusual issue has come before the committee. All undergraduate biology majors are required to take Biology 331 (Vertebrate Anatomy) in which they dissect a preserved dead cat. As the Animal Welfare Act applies to dead as well as living animals, the committee has oversight over animals used for dissection in biology classes. Kathy Smith, a biology major who wants to go to medical school, is opposed to dissection of animals on moral grounds. She feels that it is unnecessary and that she can learn the material just as well using books, plastic models, and a computer program that simulates cat dissection. She has requested permission to opt out of the dissection part of the class. She agrees to learn the material and be tested on it – but not on a dead cat.

Professor Greene, the instructor, has rejected her request. He is sympathetic with her moral views on the treatment of animals, but he feels that a deep appreciation of anatomy can only come through the dissection of real specimens. He does not feel that plastic models are adequate substitutes for the real thing. He also argues that dissection is critical to the experience of being a biology major.

Kathy is appealing his decision to your committee.

What are the issues?

Does she have to dissect the cat if she wants to take this course and major in biology?

Case 5. Animals in Education - Brain Research (Rats)

Your group is the IACUC of Western University. Dr. Henderson teaches a rat lab as

part of his Biological Psychology course. He would like the students to learn how brain research is done and wants to use rats as subjects. Students will work in pairs. Each pair will be given a rat to use for their study. The animals will be anesthetized and holes drilled in their skulls. The students will destroy the two hippocampuses (a structure involved in learning and memory) of their rat. This is done by lowering an electrode into the rat's brain and delivering a brief jolt of electricity to the structures. This procedure will destroy the brain structures but cause no pain to the animal.

The animals will be given three weeks to recover. The rats will then be given a task in which their ability to learn will be compared with that of a group of rats that have not had their hippocampuses destroyed. Dr. Henderson acknowledges that no new information will come from this exercise. However, he justifies the use of the animals by pointing out that this will teach the students surgical skills and that it will be a powerful demonstration of the effects of the brain on behavior.

There are thirty students in his course, so he would like permission to use fifteen rats in the brain damage group.

What are the issues raised by the proposal?

Approve or disapprove?

A Some We Love, Some We Hate, Some We Eat Instructor's Resource

Animal Attitude Scale

Animal Attitude Scale	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. It is morally wrong to hunt wild animals just for sport.					
2. I do not think that there is anything wrong with using animal in medical research.					
3. There should be extremely stiff penalties including jail sentences for people who participate in cock-fighting.					
4. Wild animals, such as mink and raccoons, should not be trapped and their skins made into fur coats.					
5. There is nothing morally wrong with hunting wild animals for food.					
6. I think people who object to raising animals for meat are too sentimental.					
7. Much of the scientific research done with animals is unnecessary and cruel.					
8. I think it is perfectly acceptable for cattle and hogs to be raised for human consumption.					
9. Basically, humans have the right to use animals as we see fit.					
10. The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work.					
11. I sometimes get upset when I see wild animals in cages at zoos.					
12. In general, I think that human economic gain is more important than setting aside more land for wildlife.					
13. Too much fuss is made over the welfare of animals these days when there are many human problems that need to be solved.					
14. Breeding animals for their skins is a legitimate use of animals.					
15. Some aspects of biology can only be learned through dissecting preserved animals, such as cats.					

16. Continued research with animals will be necessary if we are to ever conquer diseases such as cancer, heart disease, and AIDS.					
17. It is unethical to breed purebred dogs for pets when millions of dogs are killed in animal shelters each year.					
18. The production of inexpensive meat, eggs, and dairy products justifies maintaining animals under crowded conditions.					
19. The use of animals, such as rabbits, for testing the safety of cosmetics and household products is unnecessary and should be stopped.					
20. The use of animals in rodeos and circuses is cruel.					

Scoring: Most items are scored on a five point scale in which SD = 1, D = 2, U = 3, A = 4 and SA = 5. However, items number 2, 5, 6, 8, 9, 12, 13, 14, 15, 16 and 18 are **reverse scored** (SD = 5, D = 2, U = 3, A = 2 and SA = 1). Total AAS scores are simply the sum of the 20 items.

The higher the score, the more the individual is concerned about animal protection. In a recent administration to 200 college students, the average scores were 57 for males and 66 for females. (Nearly all studies have found that women are more concerned about animal welfare than men.)

Reference: Herzog, H.A., Betchart, N.S. & Pittman, R. (1991) Gender, sex role identity and attitudes toward animals. *Anthrozoos*, 4, 184-191.

Male_____ Female_____

Animals in Entertainment Scale

Indicate whether you **Support**, are **Undecided**, or **Oppose** the following uses of animals.

- | | | | |
|-------------------------------------|-------------|---------------|------------|
| 1. Trout fishing | Support____ | Undecided____ | Oppose____ |
| 2. Rodeo bull riding | Support____ | Undecided____ | Oppose____ |
| 3. Cockfighting | Support____ | Undecided____ | Oppose____ |
| 4. Deer hunting | Support____ | Undecided____ | Oppose____ |
| 5. Keeping chimpanzees in zoos | Support____ | Undecided____ | Oppose____ |
| 6. Thoroughbred horse racing | Support____ | Undecided____ | Oppose____ |
| 7. Circus elephant acts | Support____ | Undecided____ | Oppose____ |
| 8. Dog fighting | Support____ | Undecided____ | Oppose____ |
| 9. Trophy hunting for African game | Support____ | Undecided____ | Oppose____ |
| 10. Breeding pedigree dogs for show | Support____ | Undecided____ | Oppose____ |

Total Support Score____

(Add up the number of activities for which you checked “Support.”)