

The Ethics of Animal Research – Teacher Notes

The previous lesson showed the extensive use of animals in the early days of space research and even today to further our understanding of the space environment. This raises important questions about the ethics of using animals in research. The use of animals in scientific experimentation has always been, and will always be a controversial subject. It is however an unavoidable fact that without animal research we would know far less about biology, diseases and medical conditions that affect humans and other animals. While researchers agree that animals should only be used when there is no known alternative and they should be treated with humane respect to avoid suffering, the scientific community continue to agree that the historical use of animals in research has allowed the development of medical treatment, surgical techniques, vaccines and the advancement of science in other areas.

As we know animals were used extensively to serve as surrogates for human beings in the early days of spaceflight to learn vital information about the environment. In recent times, although animals continue to be used in space research, valid arguments about animal suffering have led to great improvements in their treatment.

It is estimated that between 50 and 100 million animals are used in research experiments every year. Animals used in testing come from a variety of sources. While many animals, particularly worms and rats, may be purpose bred for testing other animals are still caught in the wild.

Opponents to animal testing argue that it is cruel and unnecessary, that the results never reliably predict the reaction of human physiology and that animals have the same right as humans not to be used for experimentation.

The extent to which animal testing causes suffering and the extent to which animals experience and comprehend it is one of the biggest areas of debate. The U.S. Department of Agriculture defines a “painful procedure” as one that would “reasonably be expected to cause more than slight or momentary pain or distress in a human being to which the procedure was applied”. It is noted that pain is unnecessary in the majority of animal experiments and is avoided although there is evidence suggesting that some animals experience unalleviated pain. In 1990 the *Assessment and Control of the Severity of Scientific Procedures on Laboratory Animals* published a detailed metric for use in determining the severity of pain and distress in laboratory animal procedures based on numerical evaluations of criteria such as consciousness, anaesthesia, preparation, restraint, duration, pain, distress etc. In the United Kingdom research projects are classified as mild, moderate or substantial in the amount of suffering they may cause an animal. A fourth

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category of unclassified is given to experiments in which the animal is anaesthetized and killed without recovering consciousness. In December 2001, 39 percent of experiment licences were classified as mild, 55 percent as moderate and only 2 percent as substantial, 4 percent were unclassified.

Is Animal Testing Morally Right?

The crux of the argument between pro-animal testing parties and opponents to animal testing is whether it is ethical. The arguments for animal testing include:

- Human life has greater intrinsic value than animal life
- Legislation protects all lab animals from cruelty or mistreatment
- Millions of animals are killed for food every year – is medical research not a more worthy death
- Few animals feel any pain as they are killed before they suffer

The arguments against animal testing almost perfectly counter these:

- Animals have as much right to live as humans
- Strict controls have not prevented researchers from abusing animals – although such instances are rare
- Deaths through research are unnecessary and are morally no different from murder
- Animals suffer while they are locked up and how do we know whether they feel pain?

Most scientists agree that animal testing should cause as little suffering as possible and be used only when no other option is possible. The three Rs of animal research were put forth in 1959 by zoologist William Russell and microbiologist Rex Burch. They are the guiding principles for the use of animals in research in most countries.

- Replacement – use alternative non-animal methods to achieve the same scientific aim such as testing on human cell cultures in test tubes.
- Reduction – use statistics methods to reduce the number of animal trials required to generate comparable amounts of data.
- Refinement – improving the experiments in order to reduce the possible suffering of the animal.

British law requires that any new medicinal drug to be used on humans must undergo a substantial testing program including testing on at least two different species of live mammal. One of which must be a large non-rodent. This of course means that for any company to release a medical drug for public use they must, by law, undertake a program of

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medical testing regardless of how they feel about it ethically. Almost all medical treatment you will use has been tested on animals.

Animal researchers say it will be impossible to eliminate all animal tests but scientists are always working on ways to minimise the suffering of laboratory animals and to ensure that as few animals as possible are required.

Case Study: Laika

The ethics of animal testing component is greatly aided through the case study of a famous case of animal testing and the controversy it caused, that of Laika the Russian dog and first creature to orbit the earth.

Laika was a mixed bred dog, thought to be part husky, terrier and possibly beagle, a stray found on the streets of Moscow she was 'recruited' to the Soviet space program. Laika's mission into space would be the first study of the physiological effects of prolonged weightlessness. There were theories existing as to how a living being would react to extended periods of exposure to microgravity but the only way to prove these was through experimentation. Ballistic rocket flights could only provide around 7 minutes of weightlessness and it was difficult to determine the effects of microgravity from other effects. It was determined that at least 20 minutes of weightlessness would be required in order to study the effect of microgravity on an animal. Laika would have to be placed in orbit around the Earth.

Laika was around 3 years old when she was launched into space on the Sputnik 2 spacecraft on November the 3rd, 1957. She was placed into a special pressurized capsule with padded walls and a life support system. She was secured in place with a harness and was provided with a special high nutrition gel for food and water during the flight. Laika was actually placed into the capsule and restrained 3 days prior to launch. She was carefully groomed, her coat sponged with a weak alcohol solution and electrodes attached to her body to measure her vital signs.

It was reported that Laika experienced minimal ill effects during launch and her vital signs were relatively normal under the circumstances. She did however seem somewhat agitated and her pulse rate rose to three times its resting level. After the first few hours it was discovered that weightlessness alone did not cause major changes to the vital physiological functions of a living creature. This was good news for the human space program.

However cabin temperature was climbing and began to reach unacceptably high levels. Laika was moving and barking, becoming increasingly agitated. The temperature control within the capsule was failing. Between 5 and 7 hours into the flight, telemetry showed that there were no signs of life within the capsule. Laika had died from stress and overheating,

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undoubtedly a painful and distressing death. As the world began to learn of the second Sputnik, no word of Laika's death was released.

The Sputnik 2 capsule that carried Laika into space had not been designed to be retrievable and it was planned that Laika would die in orbit. It was said that Laika would be euthanized through the use of poisoned food 10 days after launch. As the world remained unaware of Laika's demise the question remained around the world as to whether the dog would be returned to Earth. The Soviets had recovered dogs from their suborbital flights using parachutes and so it seemed to the rest of the world that it may be possible to recover the dog.

In London, the National Canine Defence League began to protest about the use of a dog in the satellite. England's Royal Society for the Prevention of Cruelty to Animals received a flood of protest calls and letters. In New York, a group of dog owners picketed outside the United Nations. On November the 5th the *New York Times* contained numerous articles about Sputnik 2 including a report from an unnamed Russian scientist saying that the dog could not live much longer. Further articles talked about the importance of the information being learned by sending an animal into space. On November 7th Soviet scientists were still claiming Laika was in good health though she had been dead for four days. Eventually the truth about Laika's fate emerged. On November 11th the Soviet's confirmed that the dog had died. Sputnik 2 burnt up in the atmosphere on 14 April, 1958.

The exact cause of Laika's death remained a mystery for decades. There were many conflicting accounts in Soviet reports. Some saying she lived a week, others saying she had indeed been euthanized with poison. Much later Soviet sources hinted at the fact that Laika had only lived a few hours. This was not confirmed until 2002 when Russian scientists confirmed that Laika died between 5 and 7 hours after launch due to heat and stress. Russian scientist Oleg Gazenko, who worked on the Soviet space program stated that "the more time passes, the more I'm sorry about it. We did not learn enough to justify the death of a dog."

The presence of a dog in space captured the worlds imagination. Laika became a hero to the Soviet people and was admired all around the world becoming one of the most famous dogs in history. Her flight immediately proved the near term capability of humans to be launched into space. The question of whether the sacrifice of Laika was justified in the progress of space technology is still debatable in the context of the ethics of animal research. Could the flight have been postponed until recovery of the capsule was possible? However due to the political tensions between the Soviets and the United States at the time, and the 'space race' that was occurring the ethical considerations of the mission did not appear to be properly considered. Was the mission justifiable?

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