Young People's Perceptions of the Use of Animals in Scientific and Medical Research in the United Kingdom

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Summary

Discussion of the moral and ethical issues surrounding the use of animals in scientific and medical research is included in the specifications for the United Kingdom high school science curriculum. Seminars organized for students attending high schools and colleges within the Yorkshire and Humberside region of the UK provided the students with scientific arguments justifying the use of animals in research, as well as the opportunity to discuss the issues raised with their peers and to reflect on their own views on the topic. Audience response handsets were utilized both to gather student opinions and to promote debate. After the workshop, 63% of students either agreed or strongly agreed that these seminars provided them with the opportunity to consider whether or not animals should be used in research. There was a significant shift in student opinion post-session, with 64% agreeing or strongly agreeing with the use of research animals compared to 36% before the session. This study highlights the need for high school students within the UK to be provided with unbiased information so that they can make an informed decision for themselves as to whether or not such use is morally and scientifically justified.

Keywords: animals, research, in vivo, ethics, young people

1 Introduction

Post 2006, the emphasis within the United Kingdom high school science curricula shifted from the acquisition purely of scientific knowledge to both the acquisition and application of this knowledge, i.e., "*Science and society*." Discussion of the use of animals in scientific and medical research, and in the drug discovery process – as well as the ethical issues surrounding this use – was included in the curriculum specifications for all combined science and biology general certificates of secondary education (GCSE) and general certificates of education (GCE), the public examinations UK students normally take at 15-16 and 17-18 years of age respectively. For example, the Edexcel Biology GCE specification requires students to "*Discuss the moral and ethical issues relating to the use of animals in medical research*." (Edexcel, 2008)

However, whilst recent polls of the UK adult population undertaken on behalf of the UK Government demonstrate that 83% conditionally agree with the use of animals in research (Ipsos MORI, 2010), there are no similar studies of the views of young people within the UK. With the impending transposition of the new European Directive on animal welfare, Directive 2010/63/EU (European Union, 2010), into UK legislation, there is increased public awareness and interest in the use of animals in research. Young people are the electorate of the future, with the ability to influence the future direction of legislation governing animal welfare and the use, or otherwise, of animals in research. Therefore, it is essential that these individuals are provided with sufficient unbiased information to enable them to make an informed decision for themselves on the use of animals in scientific and medical research. It is also of interest to ascertain their views on this topic.

2 Enabling students to make an individual informed decision on the use of animals in scientific and medical research

Given that high school teachers normally only have one or, at most, two lessons to teach their students about the use of research animals in the drug discovery process and to discuss the underlying moral and ethical issues, they welcome assistance in the delivery of this teaching. As such, I am invited, on average every three weeks, by teachers from high schools and colleges throughout the Yorkshire and Humberside region of the UK to discuss with their students the use of animals in research and the underlying ethical issues. The majority of these invitations come directly from the schools themselves, with some indirectly via the Understanding Animal Research "Speakers in Schools" initiative[1]. Students are 11 to 18 years of age, with up to 150 students in an individual session.

My intention in these discussion sessions is to provide unbiased information so that students can subsequently make an informed decision for themselves on the use of research animals.

[1] http://www.understandinganimalresearch.org.uk/homepage

From the outset, I inform students that, while I use animals in my own research, I am happy for them to hold alternative views on the topic. Rather than didactic delivery of potentially biased information, the session is purposely structured to promote discussion and to enable students to develop and consider their own opinions on individual issues or topics. Audience response handsets are utilized throughout the session to gather student opinions anonymously, without any influence of their peers in these decisions, and to facilitate these discussions.

Typically, within a 55 minute lesson slot, I will spend 3-4 minutes introducing myself, my scientific career from high school onwards, how I got to my current position as a Senior Lecturer (Associate Professor) in Neuroscience and Scientific Ethics, and my current research. Audience response handsets are utilized to ascertain how often students have previously considered the use of animals in scientific and medical research and their views on the topic. The benefits of animal research in improving human health, preventing or curing disease, and treating injuries are then discussed before asking students what information they would want to be provided with before they took a medicine. Student responses to this include: will it work, what are the side effects, how long or how often should I take it.

Audience response handsets again are utilized to ask students which experimental preparations, techniques, or trial participant populations they would prefer used to obtain this information: e.g., straight into patients with no prior clinical trials or other studies, clinical trials first on prisoners or the mentally/physically disadvantaged, studies using animals prior to humans, or the use of complementary experimental techniques and preparations. The ethical issues surrounding the use of all of these options are debated prior to discussion of the use of complementary experimental approaches, research animals, and humans in the drug discovery process. Also addressed are the key scientific questions that can be addressed with each and the complementary and synergistic role they all play in the development of new medicines.

The principles of the 3Rs are then introduced and discussed. With respect to refinement, while analgesics and anesthetics can be administered, where appropriate, during or after an experimental study, the need to minimize pain, suffering, and distress throughout an animal's lifetime, from the moment it is born to the moment it dies, is highlighted and stressed. The best way to do this is to house a research animal in as natural an environment as possible. Therefore, students are collectively invited to design a home cage or enclosure for a research animal of their choice, balancing animal welfare against scientific needs in their design (Fig. 1). Each design is then compared to how animals are housed in scientific establishments. While best practice is highlighted, students are made aware that practices differ between establishments, and particularly between countries. Finally, ways to reduce the number of animals used in research e.g., the introduction of new technologies or better experimental design is discussed. If time permits, the debate then turns to the increasing use of genetically modified animals in research, the benefits and harms of such use, and the underlying ethical issues.

All of the above takes thirty minutes of a typical fifty-five minute lesson slot; the remainder of the session is purposely given over to students to enable them to ask questions about, or discuss further, some of the issues raised, or to seek further information. At the end of the session, audience response handsets are again utilized to determine whether the session has been beneficial in enabling them to consider their views on the use of animals in research and their post-session views on the issue.

3 Outcomes of the session

Given that the majority of young people have rarely or never considered whether or not animals should be used in scientific and medical research, the principal aim of delivering presentations on the topic, combined with discussing the issues raised with students, was to provide them with the opportunity to reflect on their views and to enable them to come to an informed decision as to whether or not the use of animals in research is morally and scientifically acceptable. This aim was achieved; post-workshop 63% of students either agreed or strongly agreed that the workshop had provided them with the opportunity to consider these issues. Furthermore, there was a significant shift in student opinion post-session: 64% agreed or strongly agreed with the use of research animals compared to 36% before the session.

Feedback from the teachers indicated that the session was an exceptional educational learning experience for their students. The session provided the information in an unbiased way and was structured such that it enabled students to discuss and reflect on their views on the topic without peer pressure or influence. As such, it met the requirements of the relevant GCSE and GCE specifications. All teachers invited the speaker to return the following year to deliver a similar session.

4 Questions and concerns raised by WC8 delegates

As a scientist who uses research animals, you are unable to provide students with objective and unbiased information on the use of animals in scientific and medical research.

If the information had been provided through the delivery of a didactic lecture in which students were not given the opportunity to give or consider their own views on the topic, then this may well have been the case. However, the session was structured so that there was little direct information transfer. Instead, the majority of the content was conveyed by me posing questions and then letting students discuss individual issues with their peers, e.g., is the use of research animals necessary, what are the alternatives, how can pain, suffering and distress be minimized. From the outset, I encouraged students to consider their own views on the topic, and I told them that it was perfectly acceptable for them to hold views different from mine or those of their peers. Whatever your views on the use of research animals, this is probably the least biased way of delivering such a session.

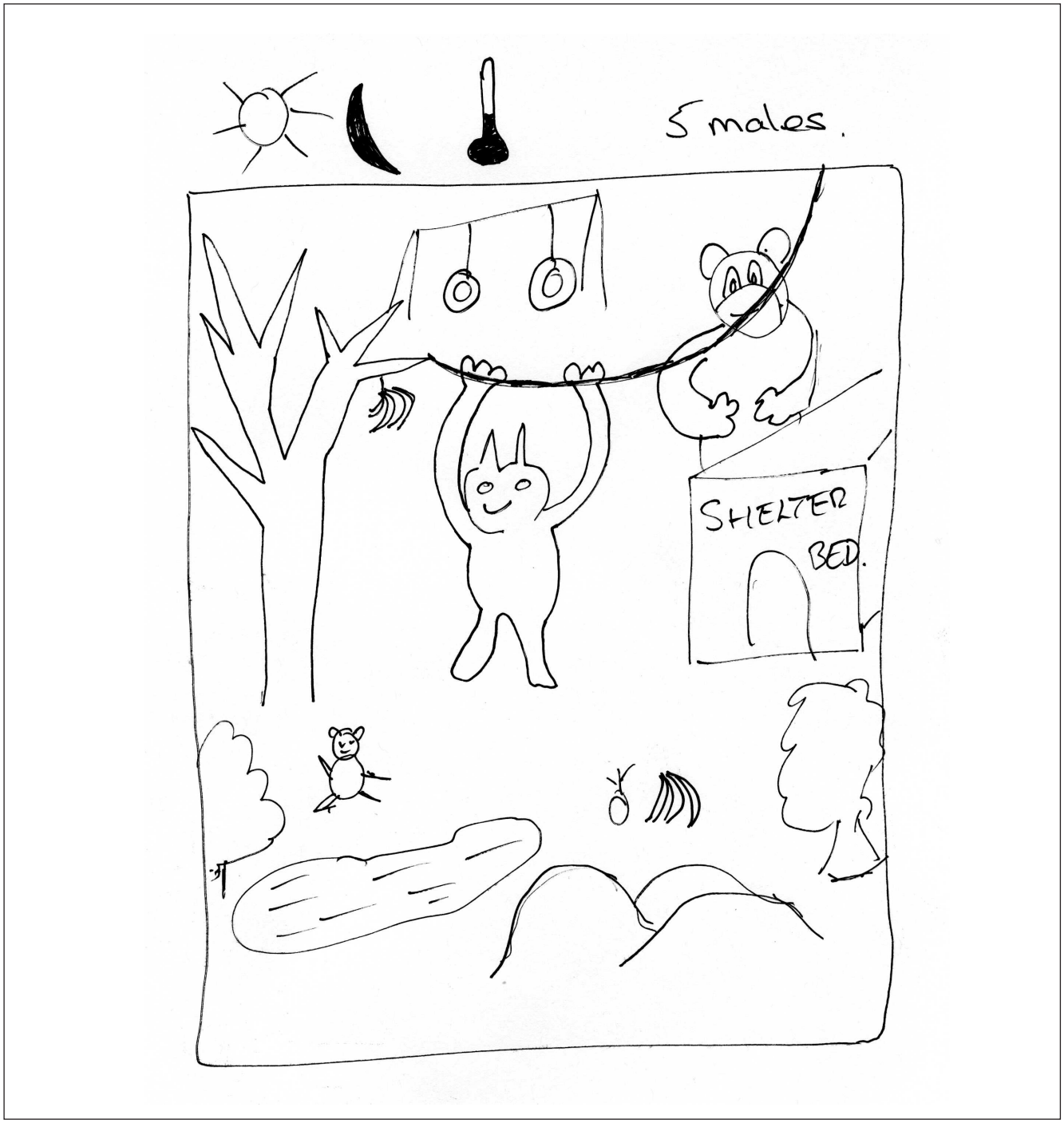

Fig. 1: Young person's illustration of their ideal home enclosure for 5 male New World monkeys

My aim throughout was solely to enable students to make an informed decision for themselves as to whether or not the use of animals in research was morally and scientifically justified.

Students are only exposed to a scientist's perspective and not that of individuals opposed to the use of research animals.
I am invited into schools by the teachers themselves. It is up to them whether they invite individuals opposed to the use of research animals, either at the same time as I visit, or on a separate occasion. However, to date, in no school or college that I have visited has there been a presentation from an individual opposed to animal experimentation, either before or in conjunction with my visit. Personally, I have no issue with students being exposed to alternative perspectives, but in order for the educational learning outcomes to be met in sessions where there are speakers both for and against the use of research animals,

care would have to be taken by both presenters to ensure that the session does not become a battle of statistics, as students would be more likely to be persuaded by the best communicator rather than the ethical or scientific arguments or evidence they present. If organizations opposed to the use of animals in research are concerned that students are only being exposed to one perspective, they should consider setting up and promoting their own "Speakers in Schools" program.

To show students best practice in the husbandry and care of research animals is disingenuous.
I would argue the opposite, that to show bad practice or examples is disingenuous. While I agree that the practices and standards of husbandry and care vary between establishments and, in particular, between different nations, whether or not you agree with the use of research animals, we should all be trying to improve these standards globally. The only way to do this is to highlight best practice, to show what can be achieved if there is sufficient will, while stressing that this best practice is not uniform across or between nations.

Scientists who use research animals and those opposed to their use come from diametrically opposite camps and are never going to agree.
Scientists who use research animals do not do so because they see *in vivo* techniques and experimental preparations as the "gold standard," rather, they feel the current alternative experimental techniques do not enable them to address the research questions they wish to ask. For example, complementary experimental techniques do not allow studies of the integrated control of multiple organs or systems or whole body function to be undertaken. If scientists could address these questions in non-animal preparations, they would do so. Indeed, UK legislation only permits the use of animals if there is no viable alternative. *In vivo* scientists also seek to apply the principals of the 3Rs, to minimize both pain and suffering and the number of animals used. Thus, rather than being at one end of the spectrum of opinion, I would suggest that scientists have similar views to individuals who promote animal welfare, are actively seeking to develop alternatives but recognize that, in certain situations, replacement of the use of animals with complementary experimental preparations is not possible.

5 Conclusions

This study has demonstrated that, prior to being confronted with the issue as an element of their high school curriculum, most young people surveyed had given little or no thought as to whether animals should be used in scientific and medical research. This highlights the need for high school students within the UK to be provided with unbiased information so they can make an informed decision for themselves as to whether such use is morally and scientifically justified.

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