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BIOETHICS IN SCIENTIFIC EDUCATION: THE IMPORTANCE OF EMPATHY IN THE LEARNING PROCESS

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Abstract: When we follow the origins of the feeling of morality and its unfolding in different human societies, we can see that, at its center, is the problem of violence and the means to avoid it, reduce it or control it. Therefore, through a study of reality and our biological aptitudes for altruistic behavior, we can observe the importance of empathy to human and scientific development. Bioethics seeks precisely to reduce the damage caused by man to other animals and to himself. And since empathy works similarly among animals of greater affinity, people who limit their moral considerations to the boundaries of their human community tend to be more indifferent to the suffering of these animals. Therefore, a society that represses our moral considerations and puts our mental health at risk, can at some point produce a population indifferent to suffering, making acts of violence common, contributing to an inhumane education, and in a specific case, it can also contribute for an inhuman science. Guided by Bioethics, this article presents an analysis of biological and philosophical contributions to the moral consideration of non-human animals, and had as objectives; to evaluate the knowledge and opinions of university students in relation to ethics and animal experimentation in their appropriate courses, to verify the existence of relationships between the opinions and empathy responses of beginning and final students regarding animal experimentation, and to verify the existence of relationships between variations in empathetic responses to speciesism.
Keywords: Education; animals; experimentation; ethic; empathy

INTRODUCTION

Since when Science began to receive criticism in relation to its ethics, the discourse which researchers support to affirm their methods, and obtain power over nature, is weakening. The famous phrase "playing god" emerged from researchers' practices in creating and manipulating life. As if that were not enough, they still imprison living and conscious animals for painful experiments until death. According to conservatives, in order to advance in research, they affirm the need to use live animals as models. Therefore, creating conscious life and making it suffer because of our curiosity and thirst for power is still a reality in research centers. But contrary to what many people think, this ends up imposing a blockage in relation to the possibilities that science can produce, and science has been advancing a lot in recent decades, allowing the creation of alternative methods to study organisms with less invasive methods, or even with their replacement by organs, tissues and cells, or even by artificial models, simulation and computers. And thinking about this, it is necessary to reflect on the ethical limits of experiments with live animals.

Ethics is the philosophical reflection on morality, that is, on the rules and moral codes that guide human conduct1. According to Marilena Chauí [2]:

> "Socratic questions inaugurate ethics or moral philosophy, because they define the field in which moral values and obligations can be established, finding their starting point: the conscience of the moral agent. Only one who knows what he is doing is a moral ethical subject, who knows the causes and ends of his action, the meaning of his intentions and attitudes, and the essence of moral values.

Still according to Chauí, ethics is a struggle against our passions and instincts, it starts from the reflective consciousness of the individual:

> "Moral conscience manifests itself, above all, in the ability to deliberate in the face of possible alternatives, deciding and choosing one of them before taking action. Has

> the ability to evaluate and weigh personal motivations, the demands made by the situation, the consequences for himself and others, the conformity between means and ends (using immoral means to achieve moral ends is impossible), the obligation to respect the established or to transgress it (if what is established is immoral or unfair).
>
> The will is that deliberative and decision-making power of the moral agent. In order for it to exercise such power over the moral subject, the will must be free, that is, it cannot be subject to the will of another, nor can it be subject to instincts and passions, but, on the contrary, it must have power over them and them. "[2]

In the words of Sonia Felipe[3], "every moral action depends on reasoning that takes into account the unity and coherence of the acts themselves in the face of the recognition of the duty (rational desire) to practice them, and in this sense ethics, as expressed by Singer interpreted by Robert C. Solomon, is nothing more than 'a process of expanded consciousness', 'the expanding circle'" – for him – "reason allows the expansion of the circle, the overcoming of the primitive impulse to take care of the good of the offspring, to the scope that surpasses the family, the village, the country, the nation, the species". In his interpretation, Solomon gave priority to reason in the process of expanding the 'moral circle', however, Frans de Waal [4] observes the 'expanding circle' in non-human animals beyond the species through the ability to empathize, without the need for the use of reason as we know it in humans. "Empathy is the ability that mammals have to put themselves in the other person's shoes and experience their emotions" – as Theodor Lipps stated, quoted by Frans de Waal – "indirectly we enter their body and participate in their experience".

For Trez & Nakada (2008); "a scientific practice that directly affects the perceptions and actions of those working in the biomedical and biological sciences, characterizing the moral status attributed to non-human animals, is the use of the "animal model" in experimentation, and an analysis of this practice can help to visualize how the anthropocentric-speciesist paradigm permeates the study and practice of modern biology".[5] And due to the existing ethical conflicts on the part of teachers and students in the study of biological sciences [5,6] – it is necessary to take a critical look at the methods used in science teaching - as studies prove that alternative methods can generate results as significant as methods that use animals.[7,8]

Several thinkers have already tried to propose breaking the hegemonic paradigm. The Norwegian philosopher Arne Naess, proposed in 1973, ''A *Ecologia Profunda*", as an alternative to the hegemonic model (Chart 1) of thinking of man as the center of nature. In Capra's interpretation (apud SIQUEIRA-BATISTA, 2009):

> "[..] deep ecology does not separate human beings—or anything else—from the natural environment. It sees the world not as a collection of isolated objects, but as a network of phenomena that are fundamentally interconnected and interdependent. Deep ecology recognizes the intrinsic value of all living beings and conceives of human beings only as a particular thread in the web of life.".[9]

Deep ecology brings in its studies a paradigm shift from the ecological perspective, where at its center are man-nature interactions on the vision of ethics and bioethics, both related to biotic9 and abiotic elements according to others. authors.[10]

HEGEMONIC WORLDVIEW	DEEP ECOLOGY
Domain of Nature	Harmony with Nature
Natural environment as a resource for humans	All nature has intrinsic value
Human beings are superior to other living beings	Equality between different species
Economic and material growth as a basis for human growth	Material goals in the service of greater goals of self-realization
Belief in ample resource reserves	Planet has limited resources
Progress and solutions based on high technology	Appropriate technology and non-dominant science
consumerism	Doing what you need and recycling
centralized national community	Bioregions and recognition of minority traditions

Table 1. Comparison between the hegemonic world view and deep ecology.

Source: GOLDIM JR, 2005 apud SIQUEIRA-BATISTA et al, 2009.

Regarding the abiotic elements, according to Singer[10] arguments are more difficult to sustain; "we will step on safer ground if we confine ourselves to argument based on the interests of sentient creatures."

Some authors who collaborated against the hegemonic worldview were the anarchists Élisée Reclus and Piotr Kropotkin. Élisée Reclus, according to Leal [11], made significant contributions in relation to the bioethics of space, the recognition of bioregions, the preservation of the environment and the traditions of minorities. Kropotkin[12] contributed to his work: "*Apoio Mutuo: Um Fator de Evolução*" with publications translated since 1902, where the author, based on Darwinian theories, argues about an important factor for the survival of species: mutualism. Kropotkin disagreed with the view of some Darwin followers who attributed competition and conflict to one of the main factors in natural selection. For Kropotkin, it is not competition, but avoiding or reducing conflicts that guarantee the best survival of populations, and he even noted the importance of mutual support and association between workers to accelerate the process of human development. Thus, he demonstrated, through observations of nature, that the most social species and – consequently – the most populous were more likely to survive extinctions caused by environmental pressures. Kropotkin also came to attribute an instinctive morality to animals, similar to what Proudhon[13] observed.

Therefore, I consider biosocial relationships important for human development, because according to Bronfenbrenner quoted by Paola Biasoli Alves [14], human development is defined as "the set of processes through which the particularities of the person and the environment interact to produce constancy and change in the characteristics of the person in the course of his life".

For Van Rensselaer Potter[15] humanity urgently needs a new wisdom that provides "the knowledge of how to use knowledge" for human survival and for the improvement of the quality of life, and suggests the term bioethics for this science of survival, which according to him must be built on the science of biology and ethics. Here I consider

knowledge according to David Hume quoted by Matos[16], which says "every animal presents instinctively, knowledge being a network of information generated by habit" – in this interpretation – "the structures of knowledge in human beings, and similar ones in other living beings, are explained taking into account their development through natural processes such as natural selection".

For Pegoraro[17], Bioethics, in addition to an "applied ethics", is a "philosophical ethics that specializes in following the progress and ethical problems of genetics, biomedicine, the biosphere and ecosystems". For Diniz and Guilhem [18], "bioethics is concerned with all life situations that are in the midst of different moral choices regarding the standards of well-being".

According to Chaui[2], ""When we follow the history of ethical ideas, we can see that at its center lies the problem of violence and the means to avoid it, reduce it or control it, and different social and cultural formations have instituted sets of ethical values as standards of conduct. social behaviors that could guarantee the physical and psychological integrity of its members and the conservation of the social group". Still according to her, different cultures and societies have not defined and do not define violence in the same way, and yet, certain aspects of violence are perceived in the same way in different cultures and societies, forming the common background against which ethical values are erected. According to Chaui:

> "..violence is perceived as the exercise of physical force and psychic coercion to force someone to do something contrary to them, contrary to their interests and desires, contrary to their body and conscience, causing deep and irreparable damage, such as death, madness, self-harm or harm to others".[2]

For Chaui, "when a culture and a society define what they understand by evil, crime and vice, they determine what they judge violence against an individual or against the group and simultaneously, they raise positive values, good and virtue, as ethical barriers. against violence" and furthermore, "our culture and society define us as subjects of knowledge and action, locating violence in everything that reduces a subject to the condition of an object and from the ethical point of view, we are people and cannot be treated as things, and for that, ethical values offer a guarantee of our condition as subjects, morally forbidding us to be transformed into a thing used and manipulated by others".[2] For her, ethics is normative precisely because of this, its norms aim to impose limits and controls on the permanent risk of violence.

The concept of person, however limited to the human moral community, for philosophers of animal ethics this concept also applies to non-human animals. Regan uses the concept of subjects-of-a-life, while for Francione animals are people and "people are sentient and free individuals, that is, they are not the property of anyone"".[19]

Ryder, cited by Sonia Felipe[20], considers the use of the animal model in science as speciesist and clarifies the meaning he gives to the concept he proposes to describe such a procedure:

> "I use the word speciesism to describe the widespread discrimination practiced by man against other species, and to draw a parallel with racism. Speciesism and racism are both forms of prejudice based on appearances – if the other individual appears different, then he is considered to be beyond a moral standard. Speciesism and racism (and indeed sexism) ignore or downplay the similarities between the discriminator and those against whom he or she discriminates, and both forms of prejudice reveal indifference to the interests of others, and their suffering.[20]

CULTURE AND INHUMAN SCIENCE

Cruelty to animals is worrying, considering that one of the behaviors that characterizes childhood psychopathology is the cruelty they commit to other children and animals. According to humanitarian scientist Albert Schweitzer: "Whoever has become accustomed to devaluing any form of life, runs the risk of considering that human lives are also unimportant.[21]

For Laerte Levai, the pedagogy of cruelty is inserted – consciously or unconsciously – in the booklet of peoples. From the first acts of gratuitous sadism against insects, passing through the killing or imprisonment of birds and reaching the mistreatment of domestic animals, children grow up in a world where violence is part of the urban and rural scenario.[22]

For Hilda Morana and collaborators [23] the path to sadism is not clear, although it may be a combination of extreme narcissism and a brain configuration where regions related to empathy are significantly deficient, which would lead the murderer to a total indifference to the suffering of his victims. Perhaps this explains why psychopaths – popularized by Cleckley[24] –"they are described as very intelligent and rational people, however they cannot make use of empathy". So much so that Solomon quoted by Sonia Felipe [3], considered compassion to be more important than reason for ethical development.

If we take into account that ethics is the "expanding circle" that has as its starting point the moral consideration with their fellow beings and, finally, with other species, we would be in agreement with Lawrence Becker's theory of social distance, cited by Sonia Felipe.[25]

The APA (American Psychological Association) classifies antisocial personality disorder (ASPD) as being equal to psychopathy and sociopathy.[26] Some features of TPAS are; superficial affection, insensitivity, lack of empathy, lack of remorse or guilt, among others.[23,26]

According to Balenciaga, modern society is responsible for the imposition and trivialization of TPAS, where profit is above life, creating fragmentation and dispute between individuals for power, contributing to personality disorders.[27] The famous documentary "The Corporation" shows a scenario where corporations somehow acquire antisocial and psychopathic characteristics and directly influence the life and behavior of the worker and consequently in society.[28] APD can be present in individuals who are more adjusted to society, differentiating themselves by the positions of power they occupy. They can be reclusive and self-centered people. Individuals with APD are not necessarily criminals, as the 'establishment' itself accepts various forms of exploitation and manipulation of individuals, without remorse and without guilt, preserving the APD in populations.[27,28]

For Gadotti (quoted by: Valadão & Milward-de-Andrade)[29], the "modernization" of university education ended up displacing the cultural role of universities and neutralizing their traditional humanistic orientation, making them a subsidiary of the interests of service producers in a world dominated by the industrial mode of production, and for Roxana Valadão, this is the case. of the elitist sense of university education, which leads to a classist behavior, corroborating the hierarchy of its structure and evidencing the role of education as a reproducer of values and situations experienced in the stratified society in which it is inserted and this imposition ends up introducing distortions in professional training and it leads to a mismatch between the level of empowerment of individuals and the demands imposed by the course of social events.[29]

For Thales Tréz, "the use of animals, as an experiment and consolidated didactic experience, is increasingly characterized as a resource and a situation that promotes dehumanization and alienation", "reinforcing hegemonic postures for the benefit of maintaining highly questionable conceptions of practice". and science education".[30]

Guided by Bioethics, the research presented below had as objectives; to investigate the existence of relationships between the empathy responses and opinions of beginners and final year students in the areas of natural sciences regarding animal experimentation, and to investigate the existence of relationships between variations in empathy responses with speciesism. And the hypothesis was that students could, at the end of their courses, become more indifferent to the suffering of animals, characterizing this Technical-Scientific education as a speciesist educational process.

MATERIALS AND METHODS

The research was carried out between July 2012 and July 2013 at Universidade Vila Velha in the city of Vila Velha-ES. And a questionnaire adapted from Tréz & Nakada[5] e Tréz[31] it was distributed to students of the Biological Sciences, Veterinary Medicine and Pharmacy courses, from the 1st to the 8th period of the university, for them to answer about the use of animals in research and teaching; their preferences and feelings about the sacrificed animals. The periods are divided into two categories: Beginning (1st period to 4th period) and End (5th period to 8th period).

Question 01 was subjected to descriptive analysis to identify the preference (which animals to replace) of the students. They were grouped into four groups: Domestic (dogs, horses, cats, guinea pigs and rabbits); Non-domestic (rats, invertebrates, monkeys, fish, pigeons, pigs and frogs); None (no animals); and All (all animals). This way speciesism was qualified as the choice of one or more specific animals for which the student has greater moral considerations, in this case specifying the animals which they prefer to be replaced by alternative methods. The only choice that characterizes an anti-speciesist individual is to replace all animals. Identifying the speciesist choices, two speciesist groups were created, those that chose to replace none and replace domestic ones.

To verify the students' empathy response, three groups of sensations with certain values (positive with a value of +1; negative with a value of -1; and neutral with values of 0) were available in the questionnaire (Question 02), where only 3 sensations must be marked, building a Likert scale. The negative sensations are: Anguish, Guilt, Annoyance, Anger, Sadness, Difficulty concentrating. Positive feelings: Admiration, Well-being, Happiness, Pride, Satisfaction and Tranquility. Neutral Sensations: Indifference and Curiosity. As a result, the students' total score could range from -3 to +3. So they were subjected to a t test using Past 3.0 as follows; empathy x (period and sex); empathy x (course and period and sex); and finally, the relationship between empathy and speciesism, also submitted to the ANOVA test; empathy x (none)(domestic)(all).

RESULTS AND DISCUSSION

A total of 281 students were evaluated through questionnaires, 106 from biology, 66 from pharmacy, and 109 from veterinary medicine (96 men, 181 women and 4 unidentified).

Regarding the use of animals in research, students are quite favorable. However, when there are alternatives, they would not agree with the use of animals, while most of them are not aware of these alternatives (Figure 1).

There is a difficulty for students to understand what ethics is, because according to 42.5% of students the law is above ethics. This minimizes the chances of an argument as 63% of students say that teachers affirm the legality of the practices. On the other hand, 87.2% of the students agree that there is a need to discuss ethics (Figure 2).

IDENTIFYING SPECIESISM

To identify speciesism in animal experimentation was simple. For 36% of students, the preference is for "Domestic" animals when it comes to replacing them with alternative methods, against 11% for "Non-Domestic" animals. While 26% chose "No Animals", they think it is necessary to use all of them. On the other hand, 22% of students want the replacement of all animals. And finally, "Both" (when the student specifically chose the types of animals and in their count, there was a tie, between domestic and non-domestic) with 4% (Figure 3).

If we group the animals into invertebrates, birds, fish, amphibians and mammals, we can clearly see the students' preference for mammals (Figure 4). Research cited by Desmond Morris [32] made with children also showed affinities for primates and other mammals. He also notes that one of the most chosen mammals had been widely publicized by the media, which suggests a strong media/cultural influence. Another observation made by Morris was that the most chosen birds had been the penguins, supposedly because of their vertical shape capable of remembering our species, and the parrots capable of imitating our vocalization. For Morris, "these facts may be related to our unconscious desire to anthropomorphize other species."

Study carried out by Seyama and Nagayama[33] shows that people can have unpleasant impressions when looking at very realistic human features on computer-generated faces at different levels of reality, and the less strange the set of features, the more pleasant the impression it makes. They call it the Uncanny Valley and it can be seen in robots, dolls, masks, avatars and virtual reality characters, and everything else that can look human. [33].

From this, if we ignore respect for diversity, our preference for our "equals" also suggests that it is an adaptive characteristic, as facial and body expressions are more easily identified and read, contributing to better communication.

Speciesism is also evident when showing specific choices. Dogs were the most chosen to be replaced, followed by monkeys, guinea pigs and rats (Figure 5). A similar result was presented by Tréz & Nakada.[5] Our connection with dogs dates back approximately 32,000 years according to researcher Mietje Germonpre quoted by Pat Shipman [34], and according to Shipman, the domestication of these animals to be used as tools would have facilitated the dispersion and colonization of new environments. Maybe that's why we have so much empathy and consideration for these animals to this day, having become man's best friend.

Speciesism differs for males and females according to the period, as shown in the following graphs (Figure 6). Where the male gender has greater acceptance in the use of animals even if they suffer, there is an increase in this acceptance if compared from the beginning (47.7%) to the end (56.4%). For females, there is a low balanced acceptance from the beginning (29.9%) to the end (30.8%). Graphically, there is not much difference between the sexes, but between the sexes the Binomial test identified a significant difference, men tended to answer "yes" from beginning to end and women tended to answer "no" throughout the course.

Also, students tend not to feel guilty (16%

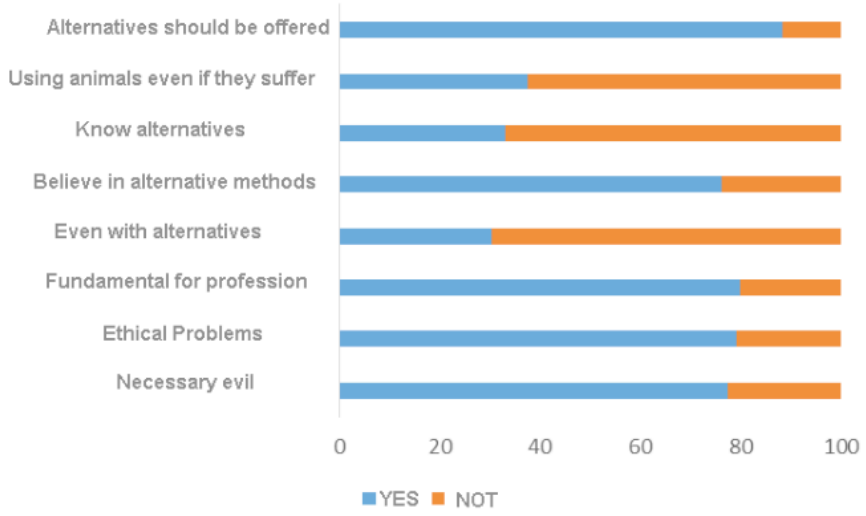

Figure 1. Graph showing the students' general opinion about the use of animals in research.

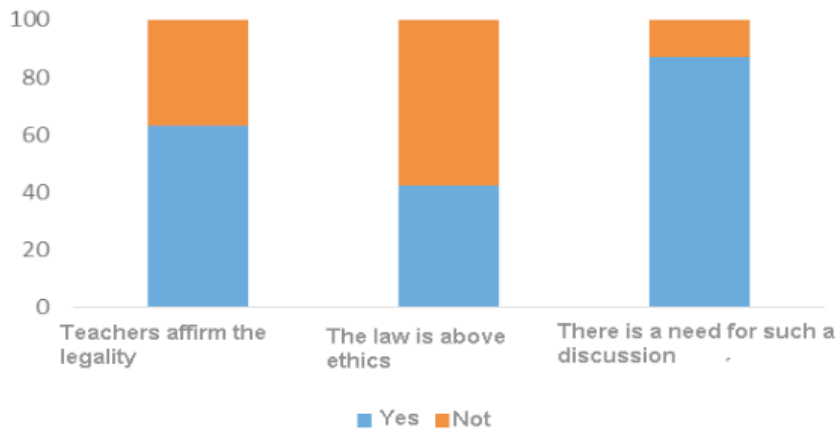

Figure 2. Graph showing the need for courses in general to discuss laws and ethics.

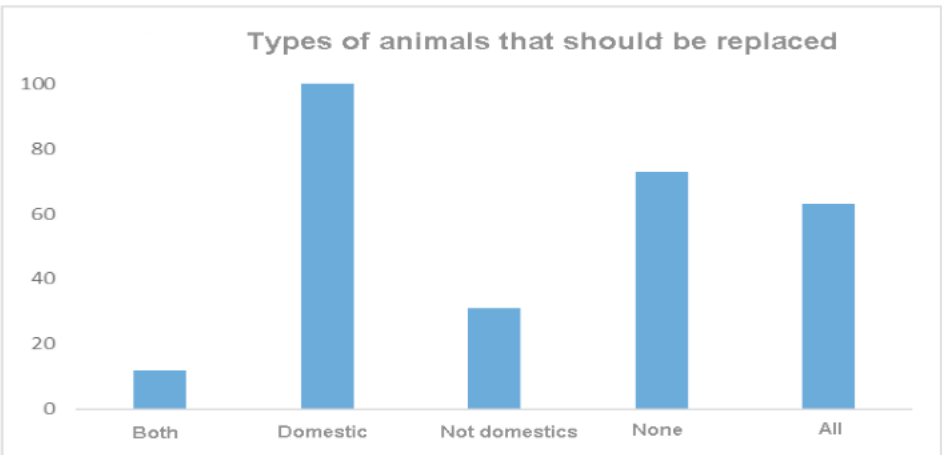

Figure 3. Graph showing the types of animals chosen to be replaced.

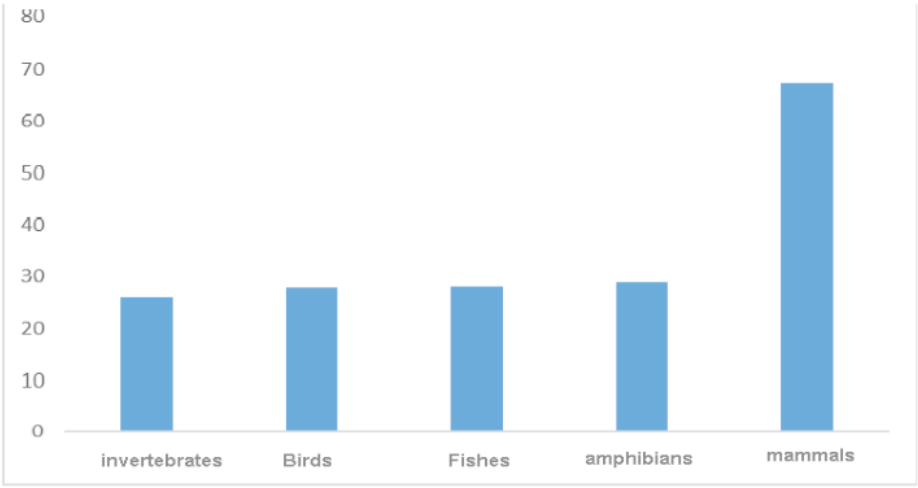

Figure 4. Graph showing the total frequency of groups of animals chosen to be replaced.

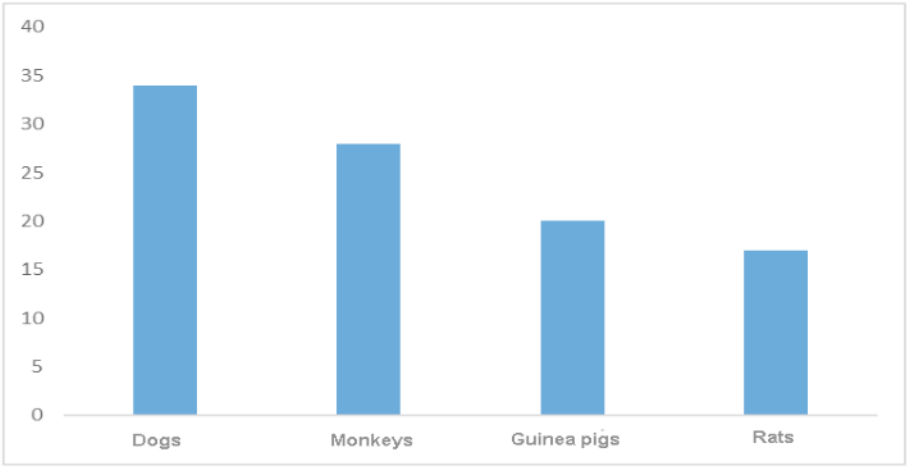

Figure 5. Graph showing percentage of the most important animals (including dogs, monkeys, guinea pigs and rats) to be replaced.

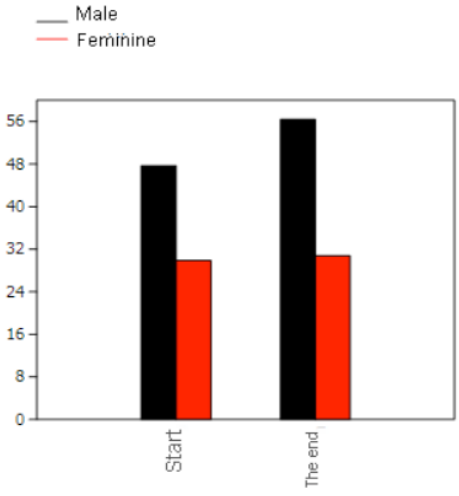

Figure 6. Graphs show the percentage of general acceptance of "the use of animals even if they suffer" for each period in relation to gender.

feel guilty) for the suffering of the animal, showing in a way that they do not want to be responsible for this relationship. On the other hand, a greater number felt distressed (41%) (Figure 7), a feeling linked to unconscious guilt[35]. Taís Gaspar considers the relationship between feelings of guilt and ethics and initially associates human malaise with the lack of guidance for acting in the world; and from there he characterizes the ethical project as the search for this orientation, and consequently, as an attempt to overcome the malaise.51 Freud presents the feeling of guilt as the most important problem in the development of civilization.[35,36]

In general, regarding the empathy response, the t test showed a significant difference between the sexes at the beginning ($p<0.001$) and at the end ($p<0.001$). However, there was no significant difference between the same sex in relation to the beginning and the end, but in comparison, men have a significantly higher median ($p<0.001$) at the end compared to the end of women, who did not show significant variation from Start to End (Figure 8). This showed that the female gender had a greater resilience compared to the male gender. Resilience is the ability of individuals to prevent, minimize or overcome the harmful effects of adversity, including emerging from these situations strengthened or even transformed.[37] On the other hand, this variation between the sexes may be related to the construction of gender identity. [38,39], that can influence the characteristics of the person in our society.

Specifically in the veterinary course, the t test showed a significant difference in the empathy response between men and women at the beginning ($p<0.05$), and between men and women at the end ($p<0.001$), where once again the females showed greater empathy response. However, between the periods there was no significant difference between the same sex. There was a significant difference between opposite sexes in relation to the period. Between men at the beginning and women at the end, the difference was significant ($p<0.05$), and between women at the beginning and men at the end ($p<0.001$) the difference was even greater because the male sex at the beginning gave greater depositions of empathy. (Figure 9).

In the pharmacy course, the t test showed a significant difference between the sexes at the beginning ($p<0.05$), but it did not show a significant difference between the sexes at the end. There was no significant difference between the periods for the same sex, although females showed greater empathy responses. There was only a significant difference between men at the beginning and women at the end ($p<0.05$) (Figure 9).

As for the biology course, the t test did not show a significant difference between men and women at the beginning, as well as it did not show a significant difference between men and women at the end. It also showed no difference for the same sex in relation to the period or between the opposite sexes in relation to the period (Figure 9).

In general, although the medians of the sexes from beginning to end are similar, except in the veterinary course for males, there is variation in levels in all groups. The male at the end of the veterinary course showed a higher level of indifference compared to all other courses, with some off-graph variations up and down in the level of empathy.

Each course and each sex have their characteristics, and this relationship with other animals can also be related to other factors, in addition to scientific education, such as the very identity of individuals and their ideas formed from other social institutions, such as school, family, media, religion, etc.

Thus, considering the influence of the belief system (culture and society) on people's

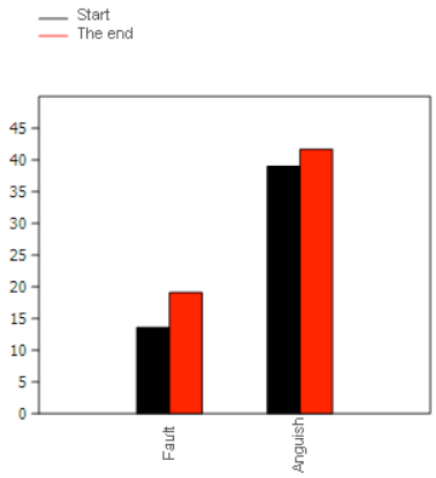

Figure 7. Graph showing the percentage of students who feel guilt and anguish for the animal's suffering.

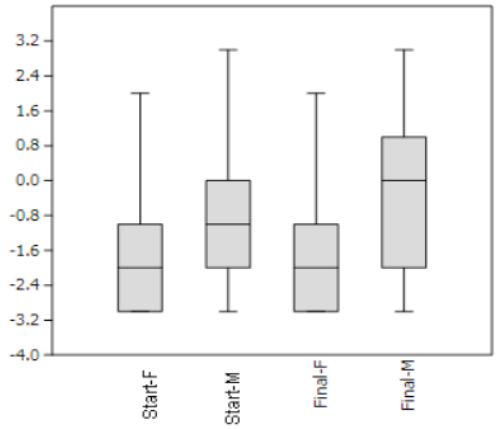

Figure 8. Graph showing the relationship of empathy between the periods of the courses in general by sex.

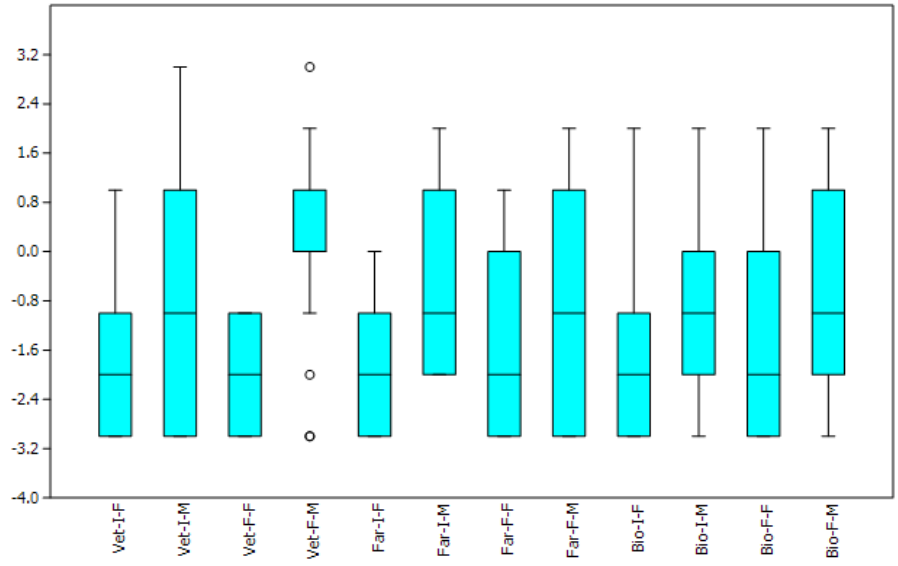

Figure 9. Graph showing empathy levels in relation to courses and period by gender. Vet=Veterinary; Far=Pharmaca; Bio=Biology; I=Start; F=Final; M=Male; F=Female.

behavior and emotions, Filippi40 carried out a study with three distinct behavioral groups (omnivores, vegetarians and vegans) to assess their levels of empathy in relation to the human and non-human animal suffering. The result showed that the Vegetarian (less speciesist) and Vegan (anti-speciesist) groups had higher empathy coefficients (Figure 10).

This result was compared with ours (Figure 11), because considering the response "All" as being anti-speciesist, it was the one that showed the greatest response of empathy in relation to animal suffering. To identify the level of empathy in relation to speciesism, the ANOVA test showed a significant result ($p<0.001$) among students who chose to replace all animals (anti-species), students who preferentially chose domestic animals (speciesist) and students who chose no animals (more speciesist). The significant difference by the t test between "All" and "Domestic" ($p<0.05$) is smaller compared to "All" and "None" ($p<0.001$). There is a greater concentration of empathy responses for those who chose "All" and "Domestic", but those who chose "Domestic" present higher values for indifference. While those who chose "None" were well dispersed with little empathy, tending to a greater indifference (Figure 11).

CONCLUSION

Despite the high acceptance of animals as a model for scientific experiments, under the allegation of a necessary evil, when it comes to suffering, opinions in favor of their use are already decreasing. The high acceptance of the use of animals in disagreement with the low knowledge about animal welfare, ethics and alternatives, takes away from the student the possibility of having an opinion based on information and the development of a critical conscience about what he does, making it impossible to ethical decision making. It was seen in some cases that the difference between periods showed variation in the students' empathy response, mainly in relation to the sexes. The study showed that gender significantly influenced more than periods in the moral consideration of other animals. Which may indicate that the technical-scientific education these students undergo can influence their moral considerations in relation to other animals, but this is not the only variable.

We have seen that each course and genre has its characteristics, and their moral considerations with other animals can also be related to other factors, other variables besides scientific education, such as the very identity of individuals and their ideas formed from other social institutions, such as school, family, media, religion, etc.

The fact that females had greater empathy and greater resilience in this research does not mean that females are biologically more adapted to this mechanism. We can consider that it is the very differentiated education to which both genders are subjected in our society.

Considering people's belief system, we can verify (assuming that everyone is speciesist) that less speciesist individuals (with some moral consideration for other animals without distinction of species) may show better empathy responses or be more sensitive to the suffering of others. animal. If this is true, we can suggest that empathy towards a certain group is a mechanism that can be developed during life (eg, with a speciesist education, as well as a racist and sexist education). Therefore, even though the different forms (and species) of life may have a greater difficulty in empathic communication between them, either because of the difficulty of recognizing the foreign body and its manifestations, or because they are seen as resources, our knowledge and ideas transform our perceptions, interfering

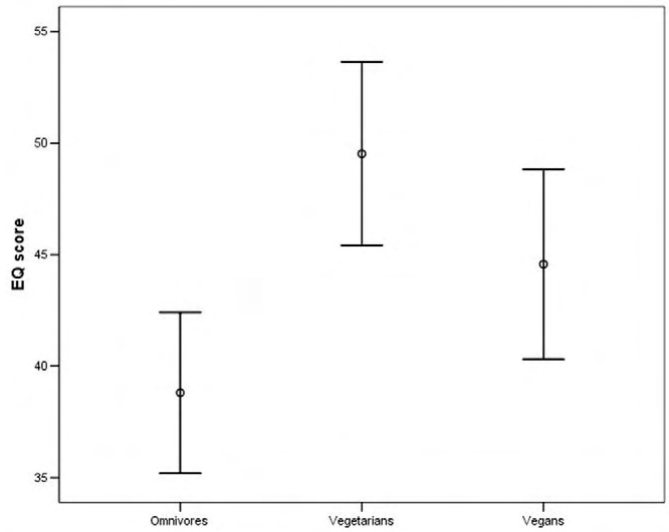

Figure 10. Graph showing the coefficient of empathy between different behavioral groups: Omnivores (species), Vegetarians (less speciesists) and Vegans (non-speciesists) (FILIPPI et al, 2010).

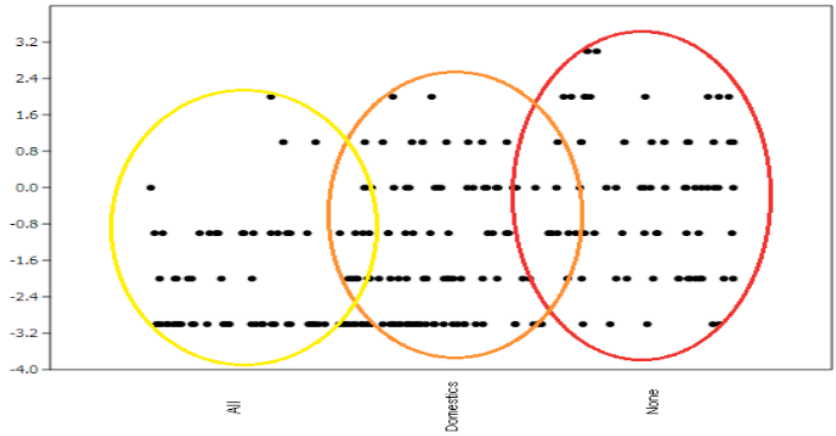

Figure 11. Graph showing the level of empathy of students who chose to replace 'All animals', 'No animals' and preferably 'Domestic'.

with our behavior.

If we consider that we have an interspecific social relationship with other animals, in speciesist practices we can identify some characteristics of APD, such as lack of remorse or guilt, superficial affection, insensitivity and lack of empathy. If we consider the intelligent and rational use of violating these animals for our own benefit, the intraspecific APD in our relationships becomes even more evident. The greatest concern for the trivialization of this behavior is precisely the difficulty of identifying individuals who really suffer from APD from those who do not, but maintain the same practices and repress their moral considerations, becoming hostages to an activity imposed by: *'establishment'*.

Further studies are needed, mainly in the development of a methodology/technology to better understand the functioning of our cognitive abilities in relation to empathy and altruism. And the study of biology and psychology guided by ethics can lead us to seek significant transformations of human actions. However, since the study of moral behavior in the field of biology and psychology is not enough to solve the problem of violence, it is necessary to reinforce the philosophical and legal aspects of Biolaw. Thus, we can develop a human society increasingly in balance with nature, and in a specific case, develop a more humane science.

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