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Respons Tanggapan Moral terhadap Keadilan dan Ketidakadilan dalam Penggunaan Manusia dan Hewan Non-Manusia dalam Penelitian dan Eksperimen Ilmiah

Moral Responses to the Justices and Injustices of Using Humans and Non-Human Animals in Scientific Research and Experiments

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Abstrak: *Wacana moral atau etis mengenai penggunaan manusia dan hewan non-manusia dalam penelitian ilmiah merupakan isu yang sangat penting, terutama berkaitan dengan keseimbangan antara kemajuan ilmu pengetahuan dan perlakuan etis terhadap subjek penelitian. Penggunaan hewan non-manusia menimbulkan dilema etis karena hewan tidak memiliki kapasitas untuk memberikan persetujuan, sehingga tindakan yang dilakukan dalam penelitian sering kali mengakibatkan rasa sakit atau penderitaan. Artikel ini menganalisis kemungkinan terjadinya eksploitasi, cedera, dan pelanggaran hak, khususnya terhadap kelompok manusia yang rentan serta hewan non-manusia yang tidak dapat memberikan persetujuan. Penelitian ini menggunakan analisis mendalam terhadap konsep-konsep etika, kasus-kasus historis, dan kerangka hukum untuk mengevaluasi perlindungan terhadap partisipan penelitian. Hasil penelitian menunjukkan bahwa meskipun telah terdapat kemajuan dalam perlindungan subjek penelitian manusia melalui persetujuan berdasarkan informasi (informed consent) dan pengawasan etis, ketidakadilan masih terus terjadi, terutama ketika kelompok yang kurang beruntung menghadapi pemaksaan dan eksploitasi.*

Kontribusi: *Artikel ini merekomendasikan penguatan aturan etika untuk melindungi hak dan martabat subjek penelitian, baik manusia maupun hewan non-manusia. Artikel ini menyimpulkan dengan menyerukan respons moral yang lebih berkeadilan melalui peningkatan pengawasan regulasi, penguatan kesadaran etis di kalangan peneliti, serta eksplorasi metodologi penelitian alternatif.*

Kata Kunci: *moralitas; bioetika; keadilan; ketidakadilan; manusia; hewan non-manusia; penelitian ilmiah; eksperimen; agama.*

Abstract: The moral or ethical discourse about using humans and non-human animals in scientific research is a critical issue, especially concerning the equilibrium between scientific advancement and the ethical treatment of subjects. Non-human animals have ethical dilemmas stemming from their lack of capacity to agree, resulting in actions that often inflict pain or suffering. This article analyzes the possibility of exploitation, injury, and rights violations, especially with vulnerable people and non-consenting animals that are not humans. The research employs an extensive analysis of ethical concepts, historical cases, and legal frameworks to assess the safeguarding of research participants. Findings indicate that while advancements have been achieved in safeguarding human subjects via informed consent as well as ethical supervision, injustices persist as disadvantaged groups face coercion and exploitation.

Contribution: The paper recommends enhanced ethical rules to safeguard the rights and dignity of human and non-human research subjects. It concludes by advocating for a more equitable moral response, emphasizing more regulatory monitoring, increased ethical consciousness among researchers, and exploring alternative research methodologies.

Keywords: morality; bioethics; justices; injustices; humans; non-human animals; scientific research; experiments; religion.

INTRODUCTION

Using human and non-human animals in scientific investigation and experimentation is a contentious problem that has historically ignited ethical disputes across several domains, notably bioethics, animal rights, and medical research. The argument centres on the ethical rationale, or absence thereof, for submitting live creatures, both human and animal, to operations that often entail pain, confinement, and injury for the sake of scientific advancement and human welfare. This article addresses the ethical conflict between the advantages of scientific research and the moral need to treat humans and non-human animals equitably. Scientific research has produced life-saving discoveries and technical developments. However, it has also prompted substantial ethical concerns about the rights of study participants, especially non-human animals, who are often seen as disposable. Ethical concerns emerge around permission, exploitation, and vulnerability, particularly about marginalized or underprivileged groups. A substantial body of literature addresses the ethics and morality of using people and non-human animals in research, with scientists contesting the moral acceptability of these methods. The writings of Singer (1975), Singer and Tse (2023), and Regan (1996) have profoundly influenced the discussion on animal rights, advocating for the ethical treatment of animals and challenging speciesism—the unwarranted favouritism towards humans over other species. Conversely, advocates such as Carl Cohen contend that animal research is essential for medical progress, positing that non-human animals do not possess the moral status of people (Nobis, 2004). The Belmont Report 1979 and other moral frameworks, including the Declaration of Helsinki, emphasize the fundamental values of respect for human beings, beneficence, and justice; however, these principles frequently provoke debate, particularly in contexts involving vulnerable populations, including prisoners, children, and individuals from disadvantaged communities (Nagai, Nakazawa & Akabayashi, 2022). Concerns exist about ethical violations in consent, exploitation, and the disproportionate allocation of risks and rewards in human research.

Notwithstanding the established rules, ethical concerns persist, especially as contemporary scientific methodologies advance.

The work that was done by Regan (1986) is considered to be one of the essential works that advocate for animal rights. Furthermore, it investigates moral issues in research and the broader picture of the ethical handling of animals. On the other hand, Stewart (2024) introduces one of the first standards of research ethics that is recognized globally. This was done in response to the horrors that occurred during World War II. The human subject's free agreement is this approach's primary emphasis. The paper written by Singer and Tse (2023) goes back over important work on the liberation of animals. It assesses the ethical advancements that have been made in animal welfare as well as ethics throughout the previous half-century. Replacement, reduction, and refinement are the three components that make up the 3Rs framework, which was presented by Hubrecht and Carter (2019). This framework is generally acknowledged as the ethical foundation for using animals in research. In his article from 2007, Fricker explores the ways in which epistemic injustices may emerge in clinical trials that include human participants, especially in disadvantaged communities, and the ethical issues that these studies provide. In 2016, the Council for International Organizations of Medical Sciences (CIOMS) published a crucial international statement outlining ethical requirements for conducting human subjects research. These standards include concerns about informed consent and justice. On the other hand, the European Commission (2023), an official resource of the European Union, explains the ethical standards for research on both people and animals. The National Institutes of Health (NIH) (2022) offers up-to-date rules and regulations regarding the responsible utilization of animals in scientific research.

This paper aims to critically evaluate the justices and injustices associated with using humans and animals in scientific investigations, providing a nuanced moral response that calls for ethical change in research methodologies. It further seeks to provide a justice-oriented moral framework applicable to research involving human and non-human participants, including the moral implications of pain and rewards linked to scientific testing. The study utilizes a qualitative research technique, including a critical examination of some current literature on bioethics, animal rights, and ethics. It also utilizes philosophical reasoning, moral principles, and case studies to assess the justices and injustice experienced by both human and non-human subjects. Initial results of this research indicate that existing ethical frameworks regulating scientific research often fail

to guarantee justice for both humans and animals that are not humans. In addition, despite advancements in guidelines for human participants, substantial ethical issues persist around informed consent, exploitation, and susceptibility, particularly among disadvantaged communities. It is also observed that the usage of non-human animals in research remains morally contentious since some studies overlook the moral value of animals and justify their use only via speciesist reasoning. The results need a reassessment of research ethics for human and non-human subjects, promoting a more inclusive and equitable framework that acknowledges the rights and well-being of all sentient entities. This research is essential as it enhances the existing discourse on research ethics by including the moral considerations of both human and non-human subjects. It also aims to offer an extensive framework that prioritizes justice and equity for all sentient beings engaged in scientific experiments. Thus, this study is significant for ethicists, lawmakers, scientists, and animal rights advocates in light of the growing worldwide focus on ethical research techniques, as seen by movements advocating for stricter animal welfare legislation and more compassionate human research methodologies.

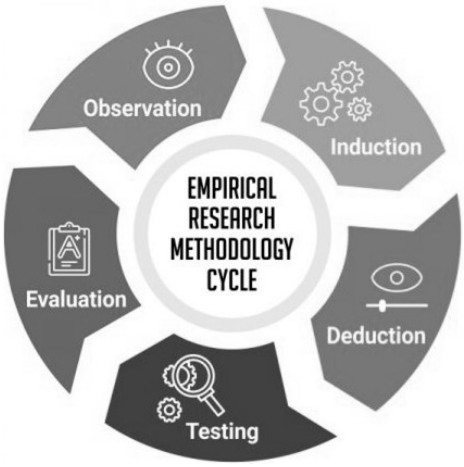
RESULT

Historical Development of Research Ethics

Research ethics has evolved over centuries in response to cultural, political, and scientific transformations. The development underscores the conflict between the quest for knowledge and the safeguarding of persons and communities participating in research. The origins of research ethics may be traced to ancient civilizations, which established broad ethical principles for treating persons (Freedman, 1987). For instance, the Hippocratic Oath, originating in the 5th century BCE, emphasizes *primum non-nocere* (non-maleficence - meaning "first, not harm") in medicine (Andersen & Rosa, 2023). During the Middle Ages and Renaissance, academic investigation was constrained mainly by theological and philosophical convictions. The period known as the Enlightenment (17th and 18th centuries) witnessed the emergence of contemporary science, characterized by a rise in empirical research and experimentation (Balls, 2010). Considerable ethical concerns marked this time since human testing often occurred without permission or monitoring. In the late 19th century, distinct limits emerged between research and clinical practice, as Bernard (2007) contended that trials should

never injure participants. Thus, developing the concept of research circle, accountability and methodology with their components make scientific research more appealing (See Figure 1 below).

Figure 1. Circle of empirical research.



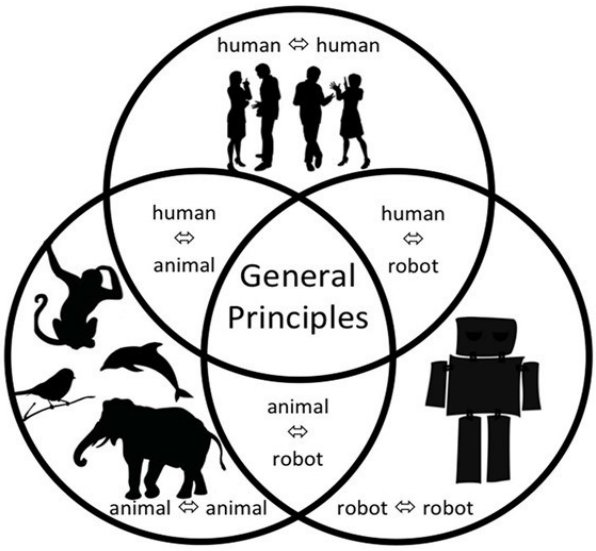
Source: QuestionPro (2024).

The Nuremberg Code, established in 1947, delineated specific standards for human research, including free agreement, the need to minimize unwarranted suffering, and the stipulation that the advantages of study must have surpassed the associated hazards (Stewart, 2024). It underscored the significance of human autonomy and safeguards against compulsion, influencing subsequent ethical research paradigms. The Declaration of Helsinki, established in 1964, broadened fundamental Nuremberg standards to include all types of research, including therapeutic and non-therapeutic endeavours (Nagai, Nakazawa & Akabayashi, 2022). The Tuskegee Syphilis Study (1932–1972) in the United States incited public anger and prompted significant revisions in research governance (Nagai et al., 2022). The Belmont Report (1979) was produced by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, delineating three fundamental values of ethical investigations: the respect of humans (autonomy along with informed consent), beneficence (minimizing harm and maximizing benefits), and justice (ensuring equitable distribution of research benefits and burdens) (Nagai et al., 2022). The Common Rule, established in the 1980s and amended in 2017, implemented these concepts under U.S. federal research rules.

Humans, animals, and artificial entities such as robots share primary forms of vocal interaction as illustrated in Figure 2 above. In research, the moral handling of animals that are not humans developed independently but acquired prominence in the twentieth

century. Philosophers like Jeremy Bentham highlighted early ethical concerns about animal welfare, asserting that the ability of animals to suffer should inform their ethical treatment (European Commission, 2023). The 1959 release of The Principles of Humane Experimental Technique by William Russell and Rex Burch presented the 3Rs principle: replacement (pursuing alternatives to animal utilization), reduction (minimizing the number of animals employed), and refinement (enhancing experimental methods to alleviate suffering) (Hubrecht & Carter, 2019). The emergence of animal rights groups between the 1970s and 1980s advocated more stringent animal experimentation limits. Legislation such as the Animal Welfare Act (1966) in the United States and analogous rules in other nations has established ethical standards for the use of animals in scientific research (Korsgaard, 2018).

Figure 2. Human, animal, and artificial entities in scientific research.



Source: Moore, Marxer & Thill (2016).

Current issues in research ethics include the advancement of scientific processes, including genetic research, artificial intelligence (AI), and the use of extensive data. Emerging disciplines such as computational biology and precision medicine provide novel ethical challenges, especially with privacy, permission, and the possible exploitation of sensitive genetic data. Research in underdeveloped nations, sometimes involving at-risk communities, has elicited concerns over exploitation and equal treatment. Initiatives to globalize research ethics have resulted in the creation of international ethical frameworks, including the guidelines presented by the Council for International Organizations of Medical Sciences (CIOMS) (2016), which aim to standardize ethical issues across many sociocultural settings.

Rationale in Using Human and Non-Human Animals in Research and Experiments

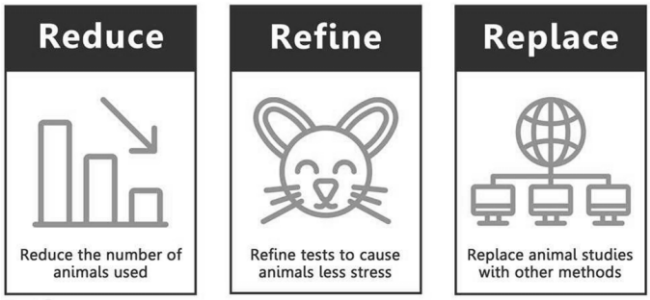
Utilizing human and non-human animals in study and experimentation is an age-old method in scientific investigation. It is motivated by the desire to comprehend biological processes, devise medicinal therapies, and enhance the overall quality of life. The justification for including both human and non-human beings in these initiatives prompts considerable ethical, scientific, and practical inquiries. Human participation in research is mainly motivated by the need to comprehend intricate human biology and pathology. Primary justifications for using human subjects are direct application, cognitive and behavioural research, ethical protections, and regulatory mandates (Regan, 1986). Nonetheless, significant ethical concerns exist, including flawed informed consent and hazards for clinical study participants. The use of non-human animals, especially rats, primates, and other types of mammals, is warranted by many factors: biological resemblance, controlled experimentation, ethical issues, and regulatory mandates (Carson, 2022). Animal models enable researchers to manipulate factors unattainable with human subjects, making them helpful in investigating illnesses, genetics, and pharmacological responses.

Ethical issues include informed permission and autonomy, speciesism, and the Three Rs Principle, which promotes replacing animals with alternative techniques where feasible, reducing animal use, and refining research to alleviate suffering (Zemanova, 2021). Nonetheless, the ethical justification for using humans and non-human animals in research sometimes clashes with deontological viewpoints that underscore the inherent rights of both groups to be protected from harm. Informed consent upholds participant autonomy, guaranteeing their voluntary acceptance of risks. Critics contend that using animals in research demonstrates a prejudiced perspective prioritizing human interests above those of other species (Carson, 2022). A burgeoning approach in ethical animal research encompasses the "3-Rs"—Replacement, Reduction, and Refinement (see Fig. 3 below) — that promotes substituting animals with alternative methodologies where feasible, decreasing the number of animals used, and enhancing experimental protocols to alleviate suffering.

Practical obstacles to performing tests on people and animals include translating data from animal models to human subjects, the emergence of technology developments that provide substitutes for animal testing, and the allocation of costs and resources. The

justification for using humans and non-human animals in research is complex, intertwining scientific imperatives with ethical issues.

Figure 3. Showing the 3-Rs in ethical animal research.



Source: Carson (2022).

Although both human and animal subjects are essential for advancing knowledge and medical therapies, the ethical problems remain unaddressed. Achieving equilibrium between the prospective advantages of research and the ethical duty to safeguard both human and non-human life is a persistent problem necessitating continuing ethical evaluation, scientific advancement, and compliance with regulatory frameworks. With the advancement of technology, there is optimism that alternative approaches may diminish dependence on animals, facilitating more compassionate and efficient research processes.

DISCUSSION

Moral Concerns in Relating to Research Conducted on Humans and Non-Human Animals

The ethical dilemmas associated with research involving humans and non-human animals have become a topic of much discussion, covering many moral difficulties. The problems include informed consent, damage reduction, fairness, and speciesism. Informed consent is a fundamental ethical concept in human research, highlighting the requirement for participants to willingly engage and comprehend the associated risks and advantages of the research (Kiani et al., 2022). Concerns emerge when engaging with vulnerable groups, like youngsters, those having cognitive problems, or those who live in socio-economically challenged circumstances, who may lack the capacity to understand the dangers or decline involvement fully. Suffering and risk in human research represent a critical ethical concern, as researchers must ensure that inflicted suffering is minimal and that the research's prospective societal benefits justify any potential hazards (Nobis,

2004). Clinical trials, particularly those evaluating novel pharmaceuticals or therapies, present significant hazards to human participants due to the often unexpected results. The ethical issue emerges when the danger to participants is considered excessive or the advantages disproportionately benefit society or commercial interests at the expense of the subjects' welfare. In these instances, the integrity of the study is called into doubt since it contravenes the fundamental ethical guideline of "do no harm."

Moral issues in animal research highlight distinct ethical problems, primarily focused on suffering and agony, including the death of sentient creatures for human objectives. Animal rights proponents contend that animals possess inherent worth akin to humans and should not be seen just as instruments for achieving objectives (Monso & Andrews, 2022; Nobis, 2004; Kiani et al., 2022). They contest the utilitarian rationale for animal research, which posits that the advantages to humanity surpass the detriments to animals. The "Three Rs" principle has been established as a foundational paradigm in the ethics of animal experimentation. This notion encourages researchers to substitute animals with feasible alternative models, diminish the number of animals used, and enhance experimental methodologies to alleviate pain and suffering (Regan, 1983). Notwithstanding these steps, the discourse continues about the potential reconciliation of ethical animal care in their use in research. The ethical accountability of researchers resides with the organizations that govern such investigations. Researchers are obligated by ethical rules to emphasize the well-being of the participants and to perform their study acceptably. Institutional Review Boards (IRBs) and Animal Care and Use Committees (IACUCs) are essential in upholding ethical standards, yet the moral obligation transcends mere regulatory compliance (Beauchamp & Childress, 2019). The worldwide movement towards more ethical research procedures indicates an increasing recognition of these moral obligations.

Components of Justices for Human and Non-Human Participants

The ethical incorporation of human and non-human subjects in scientific research has ignited discussions over the justice frameworks applicable to each group. These frameworks often pertain to research ethics based on respect, fairness, and responsibility. Justice mandates the equitable allocation of the advantages and disadvantages of research, which, in scientific experimentation, encompasses human subjects, regulated by international protocols, and non-human animals, safeguarded by

diverse animal welfare legislation. The notion of fairness in human experimentation arose from past violations, including the Nazi experiments and the Tuskegee Syphilis Study, leading to the establishment of the Nuremberg Code 1947 (Stewart, 2024) and the Belmont Report 1979 (Nagai, Nakazawa & Akabayashi, 2022). The Nuremberg Code emphasized the need for free agreement and minimizing unnecessary damage, while the Belmont Report delineated three ethical principles: respect for humans, beneficence, and justice. The latter emphasized the necessity for impartial selection of study subjects, guaranteeing that disadvantaged communities are neither unjustly targeted nor excluded from possible advantages.

Equity in study design and participant selection is fundamental to ensuring justice for human subjects. This is encapsulated in the notion of distributive justice, which seeks to equilibrate the costs of participation with the associated benefits. Research ethics necessitate equitable participation, preventing the exploitation or overutilization of vulnerable populations, including children, the elderly and economically poor persons. Rawls' (1971) theory of justice as fairness underscores the need for equitable selection in safeguarding the rights of persons from marginalized groups. Justice for non-human animals is linked to the principle of informed consent, which guarantees that participants understand the dangers, possible advantages, and research objectives. Theories of justice in this setting focus on honouring autonomy while providing essential knowledge for people to make informed choices (Ottuh, 2021). The absence of informed consent may result in injustices, particularly affecting underprivileged or less-educated groups who may not fully comprehend the study's ramifications.

Legal protection for non-human animals is established via many systems, including the Animal Welfare Act (1966) in the United States and the European Union's Directive 2010/63/EU (Stewart, 2024; Nagai, Nakazawa & Akabayashi, 2022). These regulations require the ethical evaluation of research techniques and guarantee that animals used in the study are handled respectfully, reducing suffering and discomfort. Academics contend that these rules signify a progressive acknowledgement of animals' moral standing, asserting that they should not endure harm unless warranted by significant scientific advancements (QuestionPro, 2024). A fundamental challenge in juxtaposing justice for humans and non-human animals is the question of incommensurability. Humans and animals inhabit distinct moral and biological realms, resulting in difficulties in applying the same ethical concepts to both categories. Human

justice is intrinsically linked to freedom of choice, dignity, and consent, whereas justice for non-humans emphasizes welfare, damage reduction, and the prevention of needless suffering, thus, this distinction challenges pursue a universal justice paradigm applicable to both populations (Ottuh, 2020). Therefore, the notion of justice in research involving human and non-human subjects is intricate and varied. Justice entails guaranteeing fair participation, informed consent, and equal allocation of risks and rewards for human beings. Justice for non-human animals focuses on reducing damage and upholding their well-being, informed by ethical frameworks and legal safeguards.

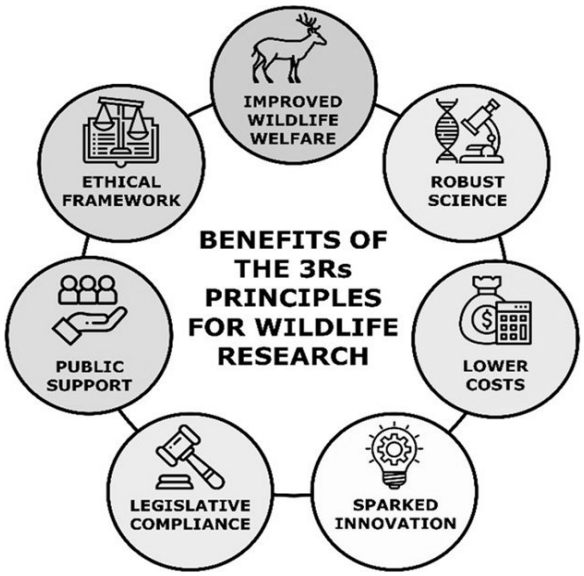
Components of Injustices for Human and Non-Human Participants

Scientific inquiry and experimentation have always raised ethical concerns surrounding the care and treatment of both human and animal subjects. The injustices consist of the exploitation of marginalized groups, breaches of informed consent, and insufficient follow-up care and recompense for individuals experiencing ill consequences. The Tuskegee Syphilis Study (1932-1972) exemplifies this since African American men were deceived and deprived of treatment for syphilis despite the availability of effective remedies (Della, 2023). Alongside human research, research using non-human animals also encounters ethical dilemmas. Animal rights proponents contend that non-human animals are sentient entities capable of feeling pain, fear, and suffering, a position that has faced criticism as a manifestation of speciesism (National Institutes of Health, 2022). Laboratory animals, including rats, mice, dogs, and primates, often endure painful treatments without adequate analgesia or anaesthetic, resulting in psychological discomfort and prolonged suffering that extends beyond the experiment's duration. The absence of permission and agency for animals in the study presents ethical dilemmas about autonomy, indicating that inflicting pain on non-consenting entities for the advantage of others is fundamentally inequitable. Institutional Review Boards (IRBs) and ethical committees have been instituted to guarantee that human participants are not exposed to excessive harm; however, disparities in protection remain, especially in cross-border research in which participants in developing countries may lack the same safeguards as those in more developed nations (National Institutes of Health, 2022). The 3-Rs principle has become a fundamental ethical paradigm for animal research with its attendant benefits as illustrated in Fig. 4 below. These benefits include sparked innovation, improved animals and humans' welfare, robust scientific advancement, cost

effective, public support, improved ethical framework, and legal compliance among others.

The above benefits of the 3-Rs additionally promote substituting animals with non-sentient models where feasible, decreases the number of animals used in tests, and enhances methodologies to alleviate pain and suffering (Zemanova (2021; Ottuh & Idjakpo, 2021). Nevertheless, the actual implementation of these principles is patchy, with sectors like cosmetics and pharmaceuticals continuing to depend significantly on animal experimentation. Cross-cultural research exploitation underscores how variations in regulatory frameworks result in injustices. Researchers may select such locales to circumvent more stringent regulations, leading to abusive procedures where participants receive insufficient protections and are treated merely as data points.

Figure 4. 3-Rs principle and benefits.



Source: Zemanova (2021).

Inequities in knowledge creation persist since human and non-human participants in poor countries or marginalized populations seldom reap the advantages of scientific study, hence repeating cycles of exploitation without corresponding advantages for the participants (Tannenbaum & Jaworska, 2018). Continuous improvements in policies and procedures are essential to rectifying these inequalities including sustaining public confidence, quality of science enablement, and the safeguarding of animal welfare as illustrated in Figure 5 below. As scientific innovation advances, it is imperative to ensure that all participants, whether human or non-human, are handled with decency, care, and

respect, hence future research should be guided by ethical frameworks prioritizing rights and obligations to rectify historical and contemporary injustices.

Figure 5. Advantages of ethical research.



Source: Tannenbaum and Jaworska (2018).

Alternatives Roles in Human and Non-Human Research and Experiments

Alternatives encompass in silico studies utilizing computational models to simulate biological procedures, diseases, and drug interactions without human involvement, as well as tissue from humans and organ-on-chip technologies that replicate human physiological circumstances for enhanced accuracy and ethical testing. Ethical trials based on volunteer participation prioritize voluntary involvement with comprehensive informed consent, hence reducing coercion and exploitation. Microdosing, in which participants are administered minimal, non-therapeutic quantities of investigational pharmaceuticals, offers a safer option for preliminary clinical trials (Emanuel, Wendler, & Grady, 2000). Non-human alternatives encompass the 3Rs principle, which promotes substituting animal models using alternative methodologies when feasible, reducing animal usage in experiments through implementing more effective research designs and refining experimental procedures to alleviate pain, suffering, and distress in animals. In vitro cell and tissue cultures, including those sourced from human skin or liver tissues, may replicate toxicological reactions and drug metabolism, diminishing the need for animal models.

Organoids and 3D bioprinting provide a precise simulation of human and animal biology, replicating the liver, heart, lungs, and brain functions (Nuffield Council on Bioethics, 2005). These technologies let researchers investigate disease causes and treatment responses in a laboratory environment, eliminating the need for live animal

experimentation. These alternatives seek to mitigate damage, decrease reliance on conventional testing techniques, and advocate for more ethical practices in scientific research. Alternative roles in research have led to substantial ethical and scientific progress, with in silico models, organ-on-chip technologies, and in vitro systems serving as transformational alternatives that reduce damage and elevate ethical standards in research (Birch, 2022). These alternatives provide a means to more compassionate and productive research methodologies; nonetheless, obstacles persist regarding technology constraints, regulatory endorsement, and cultural acceptability. The advancement and advocacy of non-animal alternatives are intrinsically connected to animal rights and welfare, addressing issues of speciesism and the ethical consideration of non-human animals. The protection of human subjects is a critical component of alternative research methodologies. Non-invasive imaging modalities, like functional MRI (fMRI) and PET scans, enable researchers to investigate cerebral activity and physiological responses without imposing detrimental procedures on participants, elevating ethical research standards and promoting participant welfare.

Global ethical standards are gaining recognition worldwide, with international rules such as the Declaration of Helsinki and the European Union's prohibition on animal testing for cosmetics promoting the development and implementation of alternatives (European Commission, 2023). Regulatory endorsement and acceptance are essential for adopting alternatives to human and animal research since governmental bodies such as the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) need considerable data to substantiate the efficacy of alternative models (National Institutes of Health, 2022). Institutional Review Boards (IRBs) and ethical committees are essential in assessing alternative approaches to ensure that human participants are not subjected to unnecessary danger when alternatives are available. Public financing efforts have significantly contributed to the advancement of alternative research methodologies. The National Institutes of Health (NIH) in the United States and the European Commission exemplify this, providing financial assistance for programs aimed at developing alternatives to animal and human testing.

Critical Moral Responses

The ethical discourse around using humans and non-human animals in scientific research and experiments usually revolves around two prominent ethical theories:

utilitarianism and deontology. Utilitarianism, linked to thinkers such as Jeremy Bentham and John Stuart Mill, is a moral framework based on consequences, positing that acts are ethically permissible if they enhance general pleasure or reduce suffering for the most significant number of sentient beings (Ottuh & Ihwighwu, 2023). The justification arises when prospective advantages, like medical advancements, illness cures, or enhancements in the standard of life for several individuals, surpass the total suffering inflicted by testing. Utilitarianism employs a cost-benefit analysis in research, positing that using animals or voluntary human volunteers may be justified if it mitigates extensive suffering. Nevertheless, it also facilitates moral injustice, especially against people. Utilitarian thinking may rationalize inflicting pain on people for a hypothetical communal advantage, even when the suffering of study subjects (human or non-human) is significant, and the possible reward remains unknown or restricted (Ottuh, 2022). Utilitarianism may be critiqued for permitting "ends justify the means" thinking, potentially resulting in ethical compromises when human dignity or animal sensibility is overlooked.

Deontology, first articulated by Immanuel Kant, is a non-consequentialist ethical philosophy emphasizing acts' intrinsic morality rather than their consequences. Deontology posits that people must follow moral obligations and principles, including respect for human and non-human creatures' intrinsic worth and worth. From a deontological standpoint, activities are deemed fair if they honour the intrinsic rights of persons, regardless of whether they are human or non-human. Deontologists contend that using human subjects in studies is ethically permissible only, provided participants provide informed permission and are not exploited. Likewise, non-human animals, especially those capable of feeling or experiencing pain, should not be used for human advantage. Unlike utilitarianism, deontology could be critiqued for its excessive rigidity. It may result in injustice when refusing to use humans or animals in research cause more significant societal damage. For instance, according to deontological ethical principles, even life-saving research may be deemed unfair if it entails the use of animals or contravenes stringent moral obligations, such as inflicting pain on others. The methodology does not assess results, implying that significant scientific advancement may be impeded in maintaining ethical standards prohibiting the exploitation of sentient beings. Contemporary ethical rules in scientific research increasingly include ideas from both justice and injustice to achieve equilibrium. The 3-Rs philosophy in animal-based

studies, seeks to balance the advantages of scientific inquiry with ethical obligations to animals by mitigating their suffering while advancing the greater good. In experiments on humans, informed consent, protection against harm, and respect for autonomy embody deontological concepts, assuring justice for each person participating. Simultaneously, utilitarian considerations underpin research that may entail some risks contingent upon the possibility of significant social advantages.

From a justice standpoint, using humans and animals should conform to the principles of respect, fairness, and dignity, ensuring informed consent for individuals and emphasizing their welfare. Injustices occur when individuals endure injury, exploitation, and coercion without their permission, mainly affecting vulnerable populations. The justice viewpoint for non-human animals prompts inquiries about their moral status and ethical responsibilities. Some contend that animals cannot grant permission, rendering it unethical to inflict suffering or death upon them to advance science (Browning & Birch, 2022). The counter-argument posits that the advantages to the well-being and health of humans may surpass the ethical costs. Injustices towards animals in research frequently involve inadequate living circumstances, unwarranted suffering, and a disregard for their inherent worth as sentient beings. Advocating for animal justice entails reducing their use in research, guaranteeing humane care, and exploring alternatives such as computational modelling or artificial biology. A vital ethical response promotes equilibrium between scientific progress and moral accountability, urging enhanced laws, humane treatment, and openness to prevent injustices against humans and animals in scientific research.

Religious viewpoints about using humans and animals in scientific study and experimentation range throughout various faiths. For instance, Christian perspectives emphasize the sacredness of life, advocating for the dignity and care of individuals while rejecting methods that use persons for experimental purposes (Ottuh & Idjakpo, 2021). The Catholic Church underscores the need for ethical concerns in research and safeguarding human dignity. Nonetheless, the Bible's dominant theology permits humans to use animals for lawful purposes, contingent upon responsible and compassionate practices. Certain theologians advocate for reducing damage to animals, contending that cruelty contravenes God's design for a harmonious creation (Ottuh, 2020). According to Sharia law, the Islamic viewpoint regulates the use of both humans and animals in scientific experimentation, which emphasizes the preservation of life and the prevention

of damage. Human life is deemed precious, and any study involving human beings must respect their humanity and physical integrity. Islamic doctrines permit the use of animals in research, provided that stringent restrictions are met to prevent needless suffering (Rahman, 2017). For Ross et al. (2011), the Hindu and Buddhist viewpoints emphasize a deep respect for all living beings, advocating non-violence (ahimsa) as a fundamental principle.

Judaism emphasizes the sacredness of human life, as articulated in the Talmud's precept of *pikuach nefesh* (saving a life) (Eisenberg, 2004). It permits the use of human subjects in research when essential for preserving life, contingent upon obtaining informed permission from all participants. Judaism prescribes compassionate treatment of animals, typified by *tsa'ar ba'alei chayim*, which prohibits inflicting undue pain on them. Indigenous and traditional faiths emphasize the interdependence of all living forms, seeing both people and animals as integral components of a holy web of existence (Britannica, 2015). Indigenous responses often advocate for an ethical framework that emphasizes harmony with the environment and restricts human supremacy over animals.

CONCLUSION

The article has examined the moral implications of employing humans and non-human animals in scientific investigations. It indicated that ethical considerations for human participants are founded on autonomy, informed consent, and harm reduction. Injustices occur when research entails coercion, exploitation, or breaches of consent, often endangering disadvantaged communities. The ethical or moral position of non-human animals is contentious since their inability to provide consent presents moral dilemmas. Ethical frameworks such as the 3-Rs (Refinement, Reduction, and Replacement) seek to reduce suffering in scientific research. Injustices occur when animals endure unwarranted pain, cruelty, or suffering, mainly when other alternatives are available. Regulatory and ethical frameworks are essential for safeguarding non-human animals; such protection often proves inadequate. Well-defined ethical laws affect humans and non-humans, but enforcement and compliance vary across scientific groups and geographical areas.

Attaining justice in scientific research necessitates the unwavering application of ethical norms that honour the intrinsic dignity of all participants while fostering scientific

integrity. When subjects' rights are ignored, or research techniques promote results above well-being, human and non-human subjects are subjected to injustices simultaneously. Nevertheless, justice may be maintained by implementing legislation, oversight boards, and frameworks meant to protect the individuals' respect, dignity, safety, and autonomy. The principles of respect for autonomy, informed consent, and limiting damage are the foundations of justice for human beings. As far as non-human animals are concerned, the moral obligation consists in alleviating their pain, ensuring that they are treated humanely, and recognizing that their lives extend beyond the scope of their value in research and experiments. Thus, a critical moral reaction must urge more stringent laws, a change in ethical language that acknowledges the moral value of non-human animals while simultaneously strengthening protections for human subjects, and institutions that respect the rights, dignity, and well-being of all individuals participating in research and experiments.

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