Linking One Health to 3R. Culture of Care as a bridge towards Russell and Burch's highest goal: Replacement

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Abstract

Animal testing has long been ethically controversial, initially due to religious and cultural beliefs and increasingly because of the obvious suffering inflicted. The 3Rs principles are now a central part of laboratory practice and have prompted discussions about adding further Rs to take account of societal values. However, this expansion can lead to contradictions, such as the emphasis on reproducibility, which implies the continued use of animals and thus conflicts with the original highest goal of the 3Rs, replacement. At the same time, the Culture of Care approach associated with the 3Rs promotes a change in the human-animal relationship but has not significantly challenged the use of animals in research. The One Health approach, which recognizes the connection between human, animal and environmental health, is also often criticized for prioritizing human health over animal welfare. This article aims to show how the One Health approach can be consistently extended to interdisciplinarity and intersectionality to include animals as stakeholders in the debate. It will also discuss the potential of the Culture of Care approach to transfer the implications of a consistently conceived One Health approach to the field of animal experimentation, in order to bring the complete renunciation of the use of sentient beings back into the focus of 3R research.

Keywords

Animal agency, Culture of Care, 3R, One Health, animal ethics, anthropocentrism

Suggested Citation Style

Ameli, Katharina, Raimann, Eva, Krüger, Jaqueline and Krämer, Stephanie (2024). Linking One Health to 3R. Culture of Care as a bridge towards Russell and Burch’s highest goal: Replacement. Journal of Animal Law, Ethics and One Health (LEOH), 77-91. DOI: 10.58590/leoh.2024.005

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I. Introduction

Examining the beginnings and subsequent development of the usage of animals for scientific purposes, it becomes clear that moral doubts and quandaries were present from the outset. Originally, these doubts were largely a product of faith and a culturally embedded respect for the dead, but as history progressed, ever more controversies arose surrounding the palpable torture animals were subjected to whilst being used for experimentation. Despite the myriad ethical concerns, there have been many biological, physiological and pathological discoveries and advances in medical sciences directly attributable to animal experimentation. New advents in the standards for animal testing, namely, the implementation of the 3Rs concept (Replace, Reduce, Refine), has however raised the question as to whether the use of laboratory animals is indispensable within scientific research, and whether alternative methods could replace animal testing altogether.

Since the implementation of the 3Rs principles in the supranational laboratory animal legislation (EU Directive 2010/63), their usage in animal-based experimental research has become an essential part of daily routines and structural processes. In addition to the initiation of numerous projects in the field of 3Rs research, in recent years there has been increased focus placed on the deeper theoretical issues related to the 3Rs. For example, consideration is being given to the addition of further Rs (Responsibility, Respect, Reproducibility and Robustness, Registration and Reporting), as well investigation of

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4 Cf. e.g. Fabienne Ferrara, ‘Culture of Care in der tierexperimentellen Forschung: Eine Frage der Vernetzung von Tierwohl und menschlichem Wohlbefinden’ (2020) 5 Versuchstierkunde Kompakt 8; Daniel Strech and Ulrich Diringhal, ‘3Rs missing: animal research without scientific value is unethical’ (2019) 3(1) BMJ Open Science.

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the structural and organizational processes that characterize animal-experimentation-based research.\(^5\)

The addition of the concepts of ‘responsibility’ and ‘respect’ to the 3Rs, in the sense of adaptation to human actions, corresponds to the contextual, normative and guiding social values. However, a ‘9Rs principle’ suggests that the use of animal models is less questioned, as the sixth R (reproducibility) clearly states that experiments must be repeatable. However, this also shows that the 9Rs concept can contain contradictions. It is therefore not surprising that this aspect is not mentioned by Russell and Burch, as both authors identify the complete renunciation of the use of sentient beings in experimental contexts as an essential and non-negotiable target. Other debates, such as those that emphasize the overlaps between the fundamental values of social benefit and animal welfare, question only the use of animal test subjects up to a certain point. These debates, spurred forward by the usage of a broader methodological framework that operates with other principles,\(^6\) can be said to no longer fully reflect the ultimate goal of the 3Rs, as intended by Russell and Burch.

The multitude of different debates in this field\(^7\) has contributed to further reflections on established organizational cultures in animal-based experimental research, both nationally and internationally, and has led to discussion and (self-)reflection on the field’s own culture.\(^8\) A review of the general analyses of organizational cultures reveals various aspects that have also been transferred to animal-based experimental research. On the one hand, key elements, such as the definition of one’s own values, the creation of internal mission statements or the commitment to certain behaviors (such as the commitment to good scientific practice) characterize the specific culture of an organization. On the other hand, an organization can be characterized as a disseminator of values, norms, and rules, the following of which provides guidance for how collective practice are organized, the feelings they produce, and the ordering and standardizing of these values.\(^9\) These aspects have also received increasing attention in the context of animal research. For example, the US Animal Welfare Act sets out institutional guidelines for animal experimentation facilities, but rats, mice, birds, fish, and reptiles are excluded from the law.\(^10\) This is because they do not fall under the legal definition of ‘animal’, and as a consequence, the majority of animals used as test subjects are denied any legal protection:

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\text{The term “animal” means any live or dead dog, cat, monkey (nonhuman primate mammal), guinea pig, hamster, rabbit, or such other warm-blooded animal, as the Secretary may determine is being used, or is intended for use, for research, testing, experimentation, or exhibition purposes, or as a pet; but such term excludes (1) birds, rats of the genus Rattus, and mice of the genus Mus, bred for use in research.}^{11}
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\(^5\) Marilyn J Brown and others, ‘Culture of Care. Organizational Responsibilities’ in Robert H Weichbrod, Gail A Thompson and John N Norton (eds), Management of animal care and use programs in research, education, and testing (2\(^{nd}\) edn CRC Press 2018).


\(^7\) Lily-Marlene Russow, ‘Ethical Implications of the Human-Animal Bond in the Laboratory’ [2002] ILAR Journal 33; Tannenbaum and Bennett (n 3); Kirk (n 3).


\(^9\) Mona Spisak, Kultursensitive Führung: Was Sie über die Organisationskultur wissen müssen, um erfolgreich zu führen (Essentials, Springer 2018) 2.

\(^10\) ‘An Act to Authorize the Secretary of Agriculture to Regulate the Transportation, Sale, and Handling of Dogs, Cats, and Certain Other Animals Intended to Be Used for Purposes of Research and Experimentation, and for Other Purposes’, Pub. L. No. 89-544 (1966).

\(^11\) Ibid.
Since the early 2000s, a Culture of Care for animal-based experimental research has been increasingly articulated and argued for.\textsuperscript{12} Culture of Care is a complex mosaic, closely linked to the 3Rs, but not yet fully embedded in the structures of animal-based research. In addition to the approaches and expert groups describing the characteristics of a Culture of Care, there are already first data collection methods to empirically assess the characteristics of a Culture of Care.\textsuperscript{13} Although if the implementation of a Culture of Care aims at a gradual paradigm shift in the way humans and animals are treated, its implementation has yet to present a significant challenge to the intentions behind the use of animal test subjects, nor to question the general use of animals in research contexts. Accordingly, the prevailing understanding of a Culture of Care in laboratory animal science can be regarded less as a replacement and more as a refinement tool, also because it does not consider animal agency, i.e. their ability to actively influence their environment.

In addition to the developments in 3R research, the influence of the One Health approach can be seen in numerous disciplines. First used in 2003, the term One Health was directly linked to the emergence of the severe acute respiratory syndrome (SARS) and later to the spread of the highly pathogenic avian influenza (H5N1).\textsuperscript{14} While the One Medicine approach in the 1960s already identified the interdependence of human and animal health and indeed can be seen as a precursor to modern theories, the One Health approach considers humans and their health as part of a shared environment.\textsuperscript{15} Despite the growing influence of the One Health approach, there is no standardized and internationally accepted definition of the concept; the following definition from the US Centers for Disease Control and Prevention and the One Health Commission is frequently used: „One Health is defined as a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment“.\textsuperscript{16} In line with its inherently holistic approach, cross-disciplinary theories and models are combined to address the interdependencies between human, animal and environmental health. Rather than looking at these areas separately, the One Health approach recognizes that the health of all stakeholders is closely interrelated and mutually influential. However, a more nuanced view reveals that ‘health’ is subject to an implicit logical and ethical stance that prioritizes human health over the welfare of non-human animals.\textsuperscript{17} Taking this line of thinking further, the One Health approach can be criticized for having an anthropocentric stance. One the one hand, the health of animals and the planet is seen as important, but on the other hand, from a more nuanced perspective, it is only seen as an end to maintain and promote human health.\textsuperscript{18} A more in-


\textsuperscript{15} E.g. Tomke Zschachlitz and others, ‘Die Bedeutung der Konzepte One Health und Planetary Health für die Umweltmedizin im 21. Jahrhundert’ (2023) 66(6) Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz 669.


depth analysis from the perspective of the humanities and social sciences could offer new perspectives. However, the inherent interdisciplinarity of the One Health approach is largely based on collaborations between disciplines in the natural sciences, so that anthropocentric elements of the approach are not sufficiently accounted for.

This article addresses precisely this desideratum. It aims to show, depending on its focus, that the One Health approach can represent both a blessing and a curse in terms of its impact on the debate about the general legitimacy of the use of laboratory animals. The premise of the approach, namely the recognition of the interconnectedness of human and animal health, can be translated into competing fields of action. The anthropocentric parts of the One Health approach have the potential to further underpin the use of laboratory animals for human health promotion and research, and simultaneously, the inherent interdisciplinarity of the approach can also be used to encourage a re-evaluation of values, beliefs and attitudes and can thus enforce sustainable changes in the culture of laboratory animal science. This article aims to explain how the One Health approach can be consistently extended to include substantial interdisciplinarity and intersectionality to consider animals as stakeholders in the debate. Following this argument, the One Health approach can serve as a pillar to support the phasing out of animal testing. The consistent inclusion of other disciplines can also contribute to the transformative consideration of animal stakeholders within the framework of the approach. In addition, the discussion will focus on the extent to which the Culture of Care approach can be perceived as an opportunity to translate the implications of a consistently conceived One Health approach into the field of animal experimentation.

While the first part emphasizes the deeply interwoven relationship between the 3Rs principle with the Culture of Care, the second part deals with the theoretical implications of a Culture of Care and explains why Culture of Care, as currently practiced, represents a refinement tool rather than focusing on the complete renunciation of the use of non-human animals in research. The third section aims towards explaining the transformative potential of Culture of Care. The link to the One Health approach offers a viable pre-requisite and mediating approach for bringing Russel and Burch’s primary goal, namely, the complete renunciation of the use of sentient beings, into the focus of 3R research.

II. The 3Rs principle as the basis for a Culture of Care

The 3Rs principle described by Russell and Burch follows a humanistic intellectual tradition in founding its original definition. Most biomedical researchers are familiar with the 3Rs principles, although scientists are usually insufficiently familiar with the historical classification of the 3Rs. This leads to a discrepancy in the definition of the 3Rs and their implementation in research. One reason for this is that although researchers are able to name and apply the 3R principles in theory, they have not read the original content of Russell and Burch, for example in their standard work "Principles of Humane Experimental Technique", and differentiated it for their own field of work. The original process in the development of today’s 3Rs strategy can be traced back to 1831, when Marshall Hall formulated five principles for the ethical treatment of laboratory animals. He identified the absence of alternatives, purposefulness, novelty, reduction of suffering and the obligation to publish as necessary characteristics. These visionary principles, considered ahead of their time, were then replaced in 1955 by Russel and Burch’s 3Rs principle. Prior to the publication of the standard work, "The Principles of Humane

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20 Cf. Kirk (n 3), 642; Gail F Davies and others, ‘Developing a Collaborative Agenda for Humanities and Social Scientific Research on Laboratory Animal Science and Welfare’ (2016) 11(7) PLOS One e0158791.
21 Cf. Tannenbaum and Bennett (n 3).
Experimental Technique”, written jointly with Rex Burch in 1959, Russell first referred to the necessary development process of the 3Rs as an “increase of humanity” at a symposium of the UFAW (Universities Federation for Animal Welfare) in 1957. The most frequently cited part of the work is the description of the instruments for implementing 'humanity', the so-called 3Rs, which are described by the authors as Replace, Reduce and Refine. Replace describes the replacement of animal experiments with an alternative procedure. If this is not possible, the minimum necessary number of laboratory animals should be used in the sense of Reduce. If animal testing must be performed, they should be improved using a Refine method so that the animals used experience as little pain, suffering or harm as possible. In addition to reducing the stress experienced by the animals in the experiment, this also includes refining the experimental procedures to maximize their welfare. Welfare in the sense of refinement means:

“The term has been used in the animal research literature to mean simply the absence of distress, but it also can be and has been used to refer to a number of different positive mental states—ranging from very mild and brief feelings of comfort; to feelings of great comfort; to satisfaction resulting from eating, drinking, and the fulfillment of certain basic physiologic needs; and to mild pleasures, intense pleasures, feelings of happiness, and happy lives.”

The attribution of feelings, happiness and indicators of well-being in laboratory animals is closely linked to the conclusion that laboratory animals respond to many, if not all, of the activities occurring around them both behaviorally and physiologically.

From this perspective, Russell and Burch discuss how the study of pain and suffering in laboratory animals is interdependent with scientific methods. In this context, they criticize the sole focus on the analysis of stress, noting that indicators of anxiety, for example, are virtually ignored. The recognition that animals can suffer has historically been a key event in animal welfare legislation and is still a driving factor for necessary changes in human-animal coexistence. Empathy is an extremely advantageous ability, as it allows individuals to recognize the affective states, both mental and physical, of fellow humans and animals. Human empathy consists of two distinct systems: cognitive empathy for perspective-taking and the formation of a Theory of Mind, and emotional empathy, which enables the sharing of emotions. Against this background, Russell and Burch describe a discrepancy between humanity and inhumanity, although the terms are not used consistently. On the one hand, the two authors use the terms to express the mental states of laboratory animals. On the other hand, both terms refer to the procedures and methods used in the treatment of laboratory animals to produce these mental states. Although there are ambiguities in Russell and Burch’s definition, the authors’ basic orientation is clear. The ambivalence of "humanity" and "inhumanity" is thus linked to the

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24 Tannenbaum and Bennett (n 3).


26 Jeremy Bentham, An Introduction to the principles of morals and legislation (Clarendon Press 1907 [1st edn 1879]).

27 Simone G Shamay-Tsoory, ‘The neural bases for empathy’ (2011) 17(1) The Neuroscientist: a review journal bringing neurobiology, neurology and psychiatry 18; Simon Baron-Cohen, ‘Autism: the empathizing-systemizing (E-S) theory’ (2009) 1156 Annals of the New York Academy of Sciences 68. It is important to note that even individuals who have no or only limited ability to feel emotional empathy due to hormonal and neurobiological phenomena, for instance, can read the emotional states of other individuals by learning to recognize patterns. e.g. Albert Newen, Anna Welpinghus and Georg Juckel, ‘Emotion Recognition as Pattern Recognition: The Relevance of Perception’ (2015) 30(2) Mind & Language 187.


29 Tannenbaum and Bennett (n 3).
influence and subjective perception of scientists working with animals. Accordingly, the experimental project is influenced by the entirely individual basic attitude towards the animal. "This means, besides taking advantage of 'lucky breaks' and the opportunities provided by experimental errors, also looking for what is being unconsciously ignored". 30

The interrelationships that emerge what researchers see in the animals, and their possibility for empathic attention shed light to the interdependency of 3R principles, whilst also pointing to an implicit organizational analysis on the part of Russell and Burch, which point to the principles outlined in the concept of the Culture of Care. 31 The two authors explicitly referred to the need for a friendly and constructive attitude towards the laboratory animals used. They see this attitude as a by-product of being human, which serves as a tool for the (further) development and refinement of experimental techniques.

The so-called "reproducibility crisis" has also heightened concerns about flawed statistics, lack of reproducibility and the unethical use of animals in research. 32 The urgency of rethinking subjective parameters and questioning research designs is also supported by research on gendered interpretations by researchers and animal responses to researchers. 33 Publication practices have also come into focus, as published results often exclude sub-areas and thus "every hypothesis (...) can be proven". 34 Analyses in animal-based experimental research have also been able to illustrate this publication bias in the sense of a preference for the publication of positive results 35 and have shown that animal-based experimental research is facing a fundamental restructuring and re-modulation of its own methods and research designs.

In view of these aspects, it is not surprising that Russell and Burch already saw a fundamental aim of their work in "to create a new discipline of applied science", which would confront the contingent cruelty (inhumanity) towards animals in biomedical research and include the reflection of subjective parameters. The close interdependence with philosophy and sociology was identified early on as an essential criterion for the success of this goal. 36 This includes the rejection of philosophies that deny animals the capacity for consciousness. 37 This aspect is also taken into account in current discussions. 38

30 Russel and Burch, The Principles of humane experimental technique by W.M. Russel and R.L. Burch (n 23) SZ.
31 Ibid 167.
37 Ibid.
38 Cf. Davies and others (n 20).
but is not considered in depth in the daily practice of animal experimentation professionals.\textsuperscript{39} The importance of interdisciplinary collaboration is considered crucial in animal-based experimental research, as the humanities and social sciences in particular have already greatly influenced animal research and will increasingly do so in the future.\textsuperscript{40} Consequently, animal-based experimental research can no longer be answered in complete isolation from social issues. Interconnected and disciplinarily multifaceted thinking and the crossing of disciplinary boundaries will be necessary.\textsuperscript{41} The rapid growth of research in the field of human-animal studies and the debates and analyses that are taking place in (inter)disciplinary discourse underline this.\textsuperscript{42} Although the multidisciplinary approach of Russell and Burch may have little appeal, especially due to the different values in their own disciplines,\textsuperscript{43} this potential gap between the disciplines should not hinder the ability to actively practice interdisciplinary alliances. Therefore, in the spirit of Russell and Burch, it should be encouraged that the complexity of animal-based experimental research is adequately addressed by interdisciplinary research that combines the findings of the individual disciplines.\textsuperscript{44}

III. Culture of Care – A theoretical approach

The term \textit{Culture of Care} has its roots in the field of healthcare and health promotion. Ferrara\textsuperscript{45} argues that the \textit{Culture of Care} within the healthcare sciences is based on the fundamentals of communication. However, a differentiated look at the healthcare sciences illustrates that parallels to the \textit{Culture of Care} concept can be found primarily in culture-sensitive care. This is characterized at its essence by trust-building words, gestures, moments and touch and is linked to an inner attitude. This includes valuing people regardless of their world view, origin or social status and treating them with empathy and compassion.\textsuperscript{46}

Following the theoretical reception of the term from the healthcare sciences and the transfer of the concept of a \textit{Culture of Care} to the animal experimentation field, the first publications on the topic appeared in 2002. The \textit{National Animal Ethics Advisory Committee} in New Zealand developed guidelines for a \textit{Culture of Care}, paving the way for discussion of the concept and the factors previously mentioned as organizational culture. While this first version of the concept still appears to be very basic, focusing in particular on institutional work processes, personnel development of those involved in animal experimentation and animal welfare, the current understanding of the \textit{Culture of Care} is characterized, among other things, by a commitment to improving animal welfare, scientific quality, personnel care and transparency for those involved: \textit{“However, the goal of the Network is: to promote a mind-set and behavior that continuously and proactively works to progress and promote laboratory animal welfare and the Three Rs, to go to a level above and beyond a culture of compliance and to include a culture of challenge”}.\textsuperscript{47}

\textsuperscript{39} Anonymus.\textsuperscript{40} Kirk (n 3), 442.\textsuperscript{41} Anonymus.\textsuperscript{42} Gabriela Kompatscher-Gufler and others, \textit{Human-Animal Studies: Eine Einführung für Studierende und Lehrende} (utb 4759. Kulturwissenschaften, Waxmann 2017).\textsuperscript{43} Kirk (n 3), 623.\textsuperscript{44} Regina Bendix and Kilian Bizer, ‘Verbundförderung für interdisziplinäre Gesellschafts- und Kulturwissenschaften: Eine Kritik’, \textit{Cultural Property Policy Papers 3 of the Göttingen Interdisciplinary Research Group on Cultural Property} (2011).\textsuperscript{45} Ferrara (n 4).\textsuperscript{46} Walter Anton and Jasmin Schön, \textit{Lernkarten Pflege: Grundlagen, Pflegetechniken und therapeutische Pflegeaufgaben} (I care, Thieme 2018).\textsuperscript{47} Norecopa (n 12).
In recent years, further analyses of this research topic – closely linked to philosophy and sociology – have also become increasingly apparent. Robinson et al. explicitly state that a Culture of Care is a (social) organizational development process that is closely linked to human resource development. When applied to animal-based experimental research, this means, firstly, that a large number of stakeholders in the organizational model are involved in complex exchange relationships. Secondly, the inclusion of animals in professional processes requires a reflective perspective if they are to be taken into account in a participatory manner within a Culture of Care. At the same time, this means that in addition to a profound change in the organizations, a remodeling of values and beliefs must also be assumed. Thirdly, this aspect can only be successful if employees develop an interdisciplinary attitude, as this is the only way to collectively ensure organizational development in the interests of people and animals. Consequently, a Culture of Care is to be understood as a transformation of existing routines and processes that is characterized by dialogical negotiation processes and re-conceptualization for all stakeholders involved in animal experimentation. This means that the animal facility management, scientists, animal caretakers and the responsible authorities are all involved as multipliers in the implementation of the 3Rs concept in general and in the implementation of a Culture of Care, i.e. a culture of appreciation and well-being for all stakeholders.

However, current debates on the concept of a Culture of Care show that the animal perspective is largely ignored in the context of experimental research. The unrecognized animal perspective can be understood here as the non-existent agency of animals; they are not understood as a body-spiritual entity that can act meaningfully and can reflexively and actively influence their environment through individual self-determination. This exclusion reveals a significant shortcoming of the concept in that the micro-perspective view of animals does not go beyond a mere discussion of the broad topic of “well-being”. In addition, the fundamental reflection on one’s own research and research designs, which is necessary for Culture of Care, and which must be questioned both ethically and methodologically, remains a peripheral area. However, both areas are very important, as Wolfe emphasizes: “If pets benefit people in this way, why should we not examine how research animals affect the people who work with them— and how that effect, in turn, might influence the research itself?” The exclusion of these aspects demonstrates the inherent anthropocentrism in animal research. While work with animals in other fields has been studied for its influential reciprocal relationships between humans and animals, or even specifically designed to study the effects of non-human animals on humans, animals in the experimental field are conceptualized solely in terms of welfare parameters. Any characteristics of animal agency are thus ignored.

Russell and Burch describe two core areas of a Culture of Care as an organizational development process: personality and social factors. Personality factors include an individual’s personality, their attitude towards people and animals and their ability to think abstractly. The two authors describe the social factors using the example of the socialization of stakeholders in animal-based experimental research and Animal Welfare Group. Assessing and benchmarking ‘Culture of Care’ in the context of using animals

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49 Lars Behrisch, Die Berechnung der Glückslichkeit: Statistik und Politik in Deutschland und Frankreich im späten Ancien Régime (Thorbecke Verlag 2016) 7.

50 E.g. Gideon Kunda, Engineering culture: Control and commitment in a high-tech corporation (rev edn Temple Univ Press 2006); Brown and others (n 5); Robinson and others (n 48).


research. They argue that in their experiments, they practice a type of treatment they once experienced in social interaction during their own lives, which they then, more or less symbolically and exaggeratedly, re-enact on the animals. This socialization leads to contamination by subjective projections. In this context, Russell and Burch\textsuperscript{54} also point out that positive and negative individual habits of researchers have a significant impact on animal-based experimental research. One reason for this is culturally legitimized routines that create inertia and rigidity.

In addition to Russell and Burch, who have already pointed to an organizational culture based on organizational and personnel development, current debates show an expanded and more differentiated analysis of a \textit{Culture of Care}. In addition to the international \textit{Culture of Care Network},\textsuperscript{55} Brown\textsuperscript{56} and Klein \& Bayne\textsuperscript{57} describe essential components such as communication, appreciation of people and animals as well as the attitude and professionalism of specialists, all of which are necessary to implement a \textit{Culture of Care}. In summary, the concept of a \textit{Culture of Care} describes a culture of valuing people and animals. According to Kunda\textsuperscript{58} and Brown et al.,\textsuperscript{59} this includes in detail: Commitment to implementing the 3Rs.

- Creating a respectful working environment
- Institutional commitment on behalf of non-humans (management plays a key role in this particular).
- Motivating and encouraging the creativity of all employees.
- Barrier-free communication within and between all stakeholders in an organization involved in animal experimentation.
- Remodeling of values, beliefs and attitudes.
- Encourage professional and interactional development of all stakeholders, strengthening the self-organization of each individual, be they animal or human.
- Lifelong learning through ongoing training programs for all stakeholders involved in animal experimentation.
- Appreciation of humans and animals: Positive relationships have a measurable impact on animal stressors. Positive interactions with caregivers can reduce abnormal behavior, increase species-appropriate behavior, and promote coping skills that help reduce stress reactivity to novel objects or situations.\textsuperscript{60} Positive interactions with the animals lead to increased morale and job satisfaction among caregivers, resulting in optimized care and improved animal welfare.\textsuperscript{61} Training can also reduce anxiety and stress in animals.

These characteristics illustrate that the concept of a \textit{Culture of Care} is less concerned with the predictable and calculable in animal-based experimental research. Rather, it focuses on the emotional and moral dimensions of laboratory animal research, which have been increasingly neglected in recent

\textsuperscript{54} Ibid.
\textsuperscript{55} Norecopa (n 12).
\textsuperscript{56} Brown (n 8).
\textsuperscript{57} Howard J Klein and Kathryn A Bayne, ‘Establishing a culture of care, conscience, and responsibility: addressing the improvement of scientific discovery and animal welfare through science-based performance standards’ (2007) 48(1) ILAR Journal 3.
\textsuperscript{58} Kunda (n 50).
\textsuperscript{59} Brown (n 8).
decades, and which are considered relevant to the success of excellent scientific research with reference to the 3Rs and the implementation of a Culture of Care. For this reason, Davies et al. argue with Donna Haraway that it is necessary to look back, hold in regard and understand that meeting the look of the other is a condition of having to face oneself. In order to achieve this, it is necessary to develop and prioritize research questions, in the sense of Davies, that get to the heart of the social and ethical problems and adequately address the dilemmas and challenges faced by the stakeholders in laboratory animals.

It is in this context that discussions on compassion fatigue come to the fore. Working with laboratory animals exposes employees to emotionally demanding and morally stressful working conditions. The emotional impact of animal research is comparable to that of working with human patients and is therefore associated with burnout or compassion fatigue syndrome. Figley and Roop highlight the close link between the mental health of employees and the well-being of animals: “Compassion Fatigue in the Animal-Care Community is a reminder that, unless we are willing to confront the animal suffering, in all its distressing forms, we cannot fulfill our calling to help fellow creatures in need.”

In addition to the development of characteristics, there are already recommendations on how the concept of a Culture of Care can be established in the everyday processes of organizations involved in animal experimentation. In addition, Directive 2010/63/EU of the European Union, adopted in 2010, created an tool for the European Member States to implement effective measures to regulate animal experiments through legislation, including the Culture of Care instrument. Although the term ‘Culture of Care’ is not included in the Directive, an analogy is found in the preamble (Article 31) as ‘Climate of Care’ showing that relevant aspects of organizational culture change are already required.

IV. Utilizing the transformative potential of the Culture of Care by adopting a consistent One Health approach

The scientific debate on the One Health approach is highly diverse and multivocal in its focus and disciplinary approaches. Given the diversity of One Health interventions, it is impossible to disentangle the specific ontological and epistemological underpinnings of different approaches. While some environmental health discussions tend to focus on the preservation of planetary health, and others explore the economic significance of One Health in relation to the containment of zoonotic risks, it is apparent that discussions of the concept of health are rarely linked to deeper discussions of environmental ethics, and even less often to nonhuman animals ethics that can provide guidance for decision-

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62 Davies and others (n 20).
64 Davies and others (n 20).
65 Charles R Figley and Robert G Roop, Compassion fatigue in the animal-care community (Humane Society Press 2006); Andreanna D Pavan and others, ‘Using a Staff Survey to Customize Burnout and Compassion Fatigue Mitigation Recommendations in a Lab Animal Facility’ (2020) 59(2) Journal of the American Association for Laboratory Animal Science: JAALAS 139.
66 Figley and Roop (n 65).
68 Kate Reid (2016). Understanding the needs to develop and implement a culture of care’ (13th FELASA Congress 03-16.06.2016, Brussels, 2016); Bertelsen (n 13); Bertelsen and Øvlisen (n 13).
69 Recital 31 Directive 2010/63/EU of the European Parliament and of the council of 22 September 2010 on the protection of animals used for scientific purposes (n 1).

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making. Even if, as Rock and Degeling state “In its most optimistic explication, One Health aims to attain optimal health for humans, non-human animals and their shared environments”, the inherent anthropocentrism of the concept becomes apparent in trade-off situations. An example of this is the 2009 outbreak of Q fever in the Netherlands caused by the bacterium *Coxiella burnetii*, when the culling of a largely healthy goat population was ordered and carried out. In this case, the killing of unaffected animals was considered a bioethically appropriate procedure when compared to the perceived risks to human health: “The exaggerated response to the Q fever outbreak was driven by the moral priority that health researchers, practitioners, and the public gave to human health, regularly at the expense of non-human welfare.” In the context of the interconnectedness of human and animal health, a clear hierarchical prioritization of human concerns convincingly and clearly demonstrates the anthropocentric perspective.

In view of the anthropocentrism discussed within the One Health approach, the question arises as to what extent this approach can be used to bring the complete renunciation of the use of sentient beings back into the center of 3Rs research. Depending on the particular focus, the concept can have contradictory effects on the debate about the general legitimacy of the use of laboratory animals. If the core premise of the approach, namely that it is not possible to separate human health from the health of non-human animals and the ecosystem, is consistently taken seriously, a radical trans- and interdisciplinary approach must be used to promote a reorientation within the concept. This could allow for profound transformations of existing power structures and knowledge production systems, while encouraging a challenge to the social norms that legitimize the use of laboratory animals. One possible solution is a consistently conceived One Health approach that is open to genuine engagement with critical theories from the humanities, social sciences and cultural studies. This would allow the One Health approach to be broadened to include an inherent agency in animals by recognizing co-constitutive entities. It would also allow the Culture of Care to be rethought in the process, while promoting an interdisciplinary attitude and, accordingly, prioritizing the question of the overall legitimacy of animal use over all other questions.

Post-humanist theories, New Materialism and feminist approaches, among others, provide useful starting points. They all encourage a reconsideration of dominant notions of agency, subjectivity and ethics in a context that recognizes the interconnectedness of humans and other animals. Despite the wide range, they all share the demand to abandon the hegemonic understanding of the (white male) human subject and to move beyond human exceptionalism as defined by Plessner’s Eccentric Positionality. For example, with reference to her cyborg figure, Donna Haraway calls for a “cross-species resistance front” within a new world order, proposing multispecies assemblages composed of humans and all other inhabitants of the earth. Haraway argues for an understanding of the real, multidimensional connections between human and non-human subjects, which are only constituted through interaction. Likewise, Rosi Braidotti’s post-humanist approach outlines a world in which human and non-human subjects are understood as political agents. She calls for the dissolution of social

73 Ibid. 63.
74 Beever and Morar (n 17) 188.
75 Clarke, Chiara and Russo (n 19); van Patter, Linares-Roake and Breen (n 18)
constructivist binaries such as nature/culture or human/non-human and designs a nomadic relational subject that, in the course of a radical deconstruction of the humanist concept of humanity, can engage in a transversal alliance between species in a life beyond the species as a planetary subject. Like Haraway, she emphasizes that only by experimenting with the attributions of the human and the non-human is it possible to confront the common planetary threats.

Karen Barad’s theory of New Materialism also offers numerous points of reference to complement a One Health approach. New Materialism provides a framework that challenges the traditional notions of the relationship between humans and the material world. Among other things, Barad introduces the concept of “intra-action” rather than “interaction”, which presupposes established bodies that then participate in action with each other. She argues that Intra-action understands agency as not an inherent property of an individual or human being to be exercised, but as a dynamic in which all designated ‘things’ are constantly exchanging and diffracting, influencing and working inseparably and are thus not independent but interwoven through their interactions. New Materialism criticizes the notion of a fixed, autonomous human subject and instead sees subjectivity as relational and dynamic.

Feminist Care Ethics also criticize traditional models of ethics such as Kantian ethics or Utilitarianism for their emphasis on rationality, autonomy and objectivity. Feminist Care Ethics has important political implications; challenging hierarchical and exploitative social structures and advocating for policies that support caring activities and address systemic inequalities. In line with the Culture of Care, it argues that traditional models of ethics neglect the importance of emotions, vulnerability, and relationality in ethical considerations. As caring relationships form the basis of health promotion within the Care Ethics, it is of great importance how people care for non-human subjects, even when these efforts conflict with public health regulations.

The above approaches are examples of numerous other theories (including those from the Global South such as Ubuntu and Buen Vivir) that deal with the deconstruction of hegemonic narratives. What they all have in common is that they challenge Cartesian dualism and develop alternative, relational ontologies that highlight the interdependence and co-constitution of humans and non-humans. Accordingly, all these approaches have the potential to encourage the urgently needed reorientation within the One Health concept and to create a coherent framework in which the obvious connection between animal and human health, with all the associated implications, is actually taken into account and, in the process of analyzing species boundaries, the legitimization of the use of animals is also questioned. It therefore becomes apparent that a consistently conceived One Health approach can be applied in areas where a remodeling of values, beliefs and attitudes has not yet taken place in a profound way, thus addressing the shortcomings of the Culture of Care approach already discussed. A comprehensively and cohesively conceived One Health approach would therefore make it possible to develop the Culture of Care further so that it becomes more than a mere refinement tool by recognizing animal agency and practicing a lived interdisciplinarity approach, even if this means reviewing the status of human hegemony. In this reading, instead of the “increase of humanity” called for by Russell and Burch in 1959, we should rather speak of an “increase of posthumanism” to overcome the established structures. In the sense of a consistently conceived One Health approach, it would no longer be necessary within ethical consideration processes to refer to contested epistemological fields of

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82 E.g. ibid.
84 Rock and Degeling (n 72).
knowledge such as the Theory of Mind or the underlying theories of animal ethics, since all non-human animals are to be considered in the same way, regardless of their cognitive abilities, which are always measured from the human perspective, i.e. from an anthropocentric bias. As a consequence of the remodeling of values and beliefs, a profound organizational change can be assumed, which corresponds to the characteristics of a Culture of Care mentioned by Kunda\textsuperscript{85} and Brown et al.\textsuperscript{86}

V. Conclusion

Culture of Care describes a complex mosaic of mutually dependent core criteria. Therefore, it cannot be characterized as a static construct, but rather as an ever-evolving concept. A Culture of Care represents essential causal conditions, some of which are also externally determined, for example, by the legal framework conditions of the organizational processes. These are therefore representing conditions that are overcome by strategies.\textsuperscript{87} Causal conditions can have an inhibiting or facilitating effect, both emerging from empirical findings and being closely related to the individual and his, her or their biography, individual attitude and form of communication.

A further aspect is seen in the academic environment, which is described in some cases as a very important intervening condition, as the pressure to publish, for example, leads to individual areas of a Culture of Care being ignored.\textsuperscript{88} This has a direct impact on the welfare of the animals used. Analyses of the Culture of Care practiced in the field show that moral and ethical dimensions play an essential role in this context, which in itself is closely interwoven with the wellbeing and health of employees. Herzog describes this with the example of a colleague who spent more than a year petting cats whose heads he then had to cut off to analyze their brains. He soon appeared “reclusive and depressed and shaky”.\textsuperscript{89} This example illustrates that individual detachment and distancing from animals has an impact and is closely linked to ethical and psychological factors.

The Culture of Care therefore includes an "ethics of caring".\textsuperscript{90} This ethic, originally associated with the work of Carol Gilligan, emphasizes the importance of considering the particular details of each situation when making ethical decisions, especially the personal relationships between those affected by a decision or action: "Within human experimental technique, cross-species epistemological cooperation was elided with that of ethical codependency: to safeguard their identity as human and scientist, the researcher had to care for the animal".\textsuperscript{91} This means that a mere implementation in the form of new guidelines is not enough to anchor sustainable changes in the structures. All these parameters mean that, in the context of a Culture of Care, the ultimate goal of the original 3Rs, the complete renunciation of the use of sentient beings, is still discussed in a very subordinate manner. Instead, there is a consensus that the use of animals is explored and discussed from the starting position that using animals is justifiable, and that those involved see themselves as capable moral agents who can influence the lives of animals through their actions.\textsuperscript{92}

Rather, we are currently facing the implementation of a Culture of Care with a mission statement that describes the progress of knowledge, the development of medical measures and the improvement of

\textsuperscript{85} Kunda (n 50).
\textsuperscript{86} Brown and others (n 5).
\textsuperscript{87} Anselm L Strauss and Juliet M Corbin, Grounded Theory. Grundlagen qualitativer Forschung (Beltz 1996) 80.
\textsuperscript{88} E.g. Dirnagl (n 34).
\textsuperscript{89} Harold Herzog, ‘Ethical aspects of relationships between humans and research animals’ (2002) 43(1) ILAR Journal 27, 27.
\textsuperscript{90} Russow (n 7), 4.
\textsuperscript{91} Kirk (n 3), 643.
\textsuperscript{92} Daniel Wawrzyniak, Tierwohl und Tierethik: Empirische und moralphilosophische Perspektiven (Human-Animal Studies vol 21, 1st edn Transcript Verlag 2019).
the quality of life of humans and animals. At this point, a brief excursus can be made with an analogy to livestock farming (the “badness of killing” argument). The fact that the breeding of animals for meat ends in slaughter, which is classified as problematic per se, can be justified by meat consumers if these animals have been given a "good life" with a high level of animal welfare beforehand. It remains open to debate as to whether the use of animals in any form can be credibly conceived as a reciprocal symbiotic human-animal relationship. This reveals a fundamental weakness in the current concept of the Culture of Care, as, unlike the 3Rs principle, it does not encourage to fundamentally question the attitude towards and the use of laboratory animals. It is also questionable to what extent the ongoing additions and remodeling of the 3R principles have the potential to change perspectives and initiate fundamental changes in the use of animals in the sense of a consistently conceived One Health approach.

For future research and discussion in this area, this means that the characteristics of a Culture of Care need to be further analyzed and developed through construction and deconstruction. However, the implementation of a Culture of Care so far seems to have been carried out from a very limited anthropocentric perspective and, because of its lack of consideration of the animals as stakeholders and relevant moral agents, should be seen as a refinement tool rather than a replacement tool. The mosaic pieces of the Culture of Care can only fit together in a complete picture if the actors involved detach themselves from their systemic positions, interact and challenge old rules. This requires a self-evident, non-hierarchical cooperation in which, for example, the management level does not provide top-down leadership and the care level receives it as a recipient. Exchange and communication must be reciprocal. This would create the conditions to meet the animal in a comparable way as well as acknowledging animal agency, as recommended by this paper as following steps in the field.

If a Culture of Care could develop in this direction, science could free itself from the human-centered perspective that allows it to use sentient beings in accordance with legal and social norms; this can succeed, as argued in this article, if the transformative potential of the Culture of Care is combined with a consistently conceived One Health approach that can credibly trace the interdependence and co-constitution of humans and non-humans through radical interdisciplinarity and intersectionality. A "simple commitment" is not enough to implement sustainable changes in the laboratory animal culture and to do justice to the deep interconnectedness of the Culture of Care in the original 3Rs principles. Nor can the Culture of Care represent a way out of laboratory animal use if it is conceived in disciplinary isolation; interdisciplinarity, particularly with the humanities and social sciences, is essential for the development of the field. A consistently conceptualized One Health approach can start precisely where the necessary reassessment of values, beliefs and attitudes has not yet taken place, and thus serve as a pillar to contribute to the phasing out of animal experimentation. In this respect, the Culture of Care offers the opportunity to act as a mediator between the implications of the One Health approach and the field of laboratory animal science. Alongside this, it can act as a stimulant to the field of a priori ethics regarding the usage of animals. Such an approach would have the potential to link the currently inadequately interconnected multidimensional parameters of animal-based research, even if this may ultimately mean that these developments are accompanied by changes in the concept of the human self.

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93 Brown and others (n 5).
94 Ibid.