Sign Systems Studies 52(3/4), 2024, 310–314

Contemporary applications of umwelt theory. Introduction

Riin Magnus[1], Nelly Mäekivi[2]

Jakob von Uexküll's works, originally grounded in biology and philosophy, have garnered increasing interest in academia. This interest is rooted in the foundational nature of Uexküll's umwelt theory, which examines how organisms perceive and interact with their environments, offering a framework for understanding subjective realities in both natural sciences and humanities (for a relevant bibliography, see Kull 2001, 2020). In the last ten years, the continuing interest has been evident in the publication of edited collections of papers (e.g. Michelini, Köchy 2020), special issues of journals (e.g. Brentari, Tønnessen 2024) and idea-historical biographies (e.g. Brentari 2015), not to mention individual articles and book chapters. Several of these studies have sought to apply Uexküll's theories in contemporary contexts and expand their scope beyond the original boundaries of umwelt theory (see e.g. Caves *et al.* 2019; Herrmann-Pillath *et al.* 2023; Schroer 2021; Tyler 2022). The goal of this volume is not only to honour Uexküll's intellectual legacy, but also to expand it further, and to invite authors to reflect on the potential of umwelt theory in addressing modern challenges and to explore the applicability of theory in contemporary contexts. We also hope that this special issue demonstrates how Uexküll's ideas continue to inspire new directions in research.

When preparing the special issue, we were wondering what domains and aspects of the modern world can be illuminated or explained proceeding from the theoretical foundations of umwelt theory. What modifications might the theory require to make it applicable in these contexts? Through which additional (theoretical) connections can these modifications be brought about?

While these days, the term 'umwelt' mainly occurs in philosophical and theoretical discussions, the origins of umwelt theory are strongly experimental. Jakob von Uexküll himself began his career as an experimental biologist, working on the

[1] Department of Semiotics, University of Tartu, Jakobi 2, 51005 Tartu, Estonia; e-mail: riin.magnus@ut.ee.

[2] Department of Semiotics, University of Tartu, Jakobi 2, 51005 Tartu, Estonia; e-mail: nelly.maekivi@ut.ee.

https://doi.org/10.12697/SSS.2024.52.3-4.01

physiology of marine invertebrates. In 1905, he wrote his first monograph on the experimental methods in marine biology *Leitfaden in das Studium der experimentellen Biologie der Wassertiere* [Guide to the Study of the Experimental Biology of Aquatic Animals] that brought out the specifics of biological methods, while stressing the need to consider the species-specific milieu in biological research, approached through observational as well as experimental methods (Uexküll, J. v. 1905; cf. Brentari 2015: 63–65). In his later career, Uexküll became Head of the *Institut für Umweltforschung* at the University of Hamburg (see Kirschner 2023). Since its establishment in 1926, the institute facilitated experimental research that ranged from studies of fighting fish movements in various territories to the underground digging behaviour of moles and the training of guide dogs for visually impaired persons (Uexküll, G. v. 1964: 145; Brentari 2015: 36). In the 1930s, however, the University of Hamburg ceased accepting doctoral theses within the field of *Umweltforschung* (Brentari 2015: 37), significantly hindering the development of this framework in experimental zoology.

Despite this setback, the conceptual grounds of umwelt research gained traction and were widely discussed in disciplines beyond zoology. Its legacy has persisted, thanks to its dissemination – along with various twists and reinterpretations – into the thinking of numerous scholars, as well as the shifts and transformations within science itself (e.g. the more-than-human turn in various fields of humanities). Within these contexts, it often functions less as a formal theory and more as a shift in perspective, enabling deeper exploration of the diverse ways of being alive. Thus, the concept of 'umwelt' is often used as a heuristic tool, and enables researchers to adopt a more emic perspective when exploring the lives and perceptual worlds of non-human animals.

Despite the evocation of umwelt theory across various contexts and disciplines, several threads initiated by its early applications have remained relatively dormant to this day. These include, for instance, studies on the temporal perception of animals, the elementary units of time for different species, and their role in adapting to anthropogenic conditions (for the applications of the time perception studies in cinematographic contexts, see Pollmann 2013, and for the extensions to other domains of reality, Fraser 2001). Another area worth exploring further is animal training that emphasizes the animal's own agency in attributing relevant meanings to objects and creating conditions that will reduce the animal's dependence on the trainer. This approach aligns with the principles of animal welfare and offers a deeper understanding of the animal's cognitive and emotional capacities. Thirdly, umwelt theory holds significant potential in the context of species protection and conservation, as demonstrated by concepts such as umwelt transitions (Tønnessen 2009), umwelt collapse (Maran 2023), and umwelt reversions

(Mäekivi 2024; Magnus, Mäekivi 2023). These concepts help characterize abrupt and major changes in species biology under Anthropocene conditions and indicate that the perceptual and meaningful component, specifically whether an animal can accommodate and make sense of altered environmental meanings, can be critical for a species' survival. Moreover, fostering such adaptations to meaning shifts through nature conservation efforts is an area that deserves further attention (see also Van Dyck 2012; Greggor *et al*. 2020).

The special issue on contemporary applications of umwelt theory offers a diverse array of topics that could speak to modern audiences and resonate with the research interests of contemporary scholars. It was partly inspired by the conference "Contemporary Umwelt Analysis: Applications for Culture and Ecological Relations" that took place at the University of Tartu, 18–19 April 2023. The volume opens with a paper by Morten Tønnessen "Applied umwelt theory in the context of phenomenological triangulation and descriptive phenomenology", that envisions a synthetic approach to studying human and more-than-human subjective experiences by incorporating first-, second-, and third-person perspectives, while also providing field-specific examples of their application. Thus, Tønnessen bridges biosemiotics and phenomenology, and offers methodological insights that indicate the versatility and interdisciplinary potential of umwelt theory. Katarzyna Machtyl's article "Umwelt and time: Extending the humanistic view on temporality through umwelt theory" also explores ways to expand the theoretical and methodological scope of umwelt theory. Machtyl connects Uexküll's umwelt theory to the concepts of 'time' and 'temporality', integrating biosemiotics, Saussurean sign relations, and Latour's 'situated time', while linking these ideas to artistic and mathematical models. Jaime F. Cárdenas-García suggests in his paper "Information is primary and central to meaning-making" an infoautopoietic approach to explain the crucial ways in which information shapes the meaning-making processes of organisms, viewing umwelt theory in a specific information-theoretical light.

Pauline Delahaye's contribution "Applied modellization of semiosphere in interspecific cohabitation context" and Nicola Zengiaro's article "Plasticumwelt and umwelt diffraction: A new materialist ecosemiotics" both focus on anthropogenic environments and the engagements of different organisms with them. Delahaye proposes methods for studying the cohabitation of humans and non-humans, specifically addressing so-called "liminal" species. Her analysis explores the causes behind certain species being perceived as nuisances and suggests strategies for improving conditions for coexistence. Zengiaro's paper, on the other hand, examines the ubiquitous presence of a human-origin material – plastic. Framed within what he terms 'material ecosemiotics', Zengiaro investigates how

the altered materiality of the environment can significantly impact and transform an organism's semiotic existence. Anton Markoš and Jana Svorcová bring an evolutionary perspective to umwelt theory in their paper "Of bubbles and foams: Umwelt counterpoints in symbiosis", exploring the establishment of ecological relationships – particularly symbiotic ones – through its framework. Finally, Masahiro Terada's paper "Umwelt theory seen from *fūdo* theory: Uexküll, Watsuji, and Imanishi on nature, harmony, and totality" extends the theory to a distant cultural context, examining how organism–environment relationships have been addressed in 20th-century Japanese philosophy and points out their compatibility with Uexküllian umwelt theoretical premises.

This special issue emphasizes the enduring relevance and adaptability of Uexküll's umwelt theory. We also hope that it invites scholars to explore further the vast potential of umwelt theory as a bridge between the humanities, natural sciences, and applied disciplines.

References

Brentari, Carlo 2015. *Jakob von Uexküll: The Discovery of the Umwelt between Biosemiotics and Theoretical Biology*. Dordrecht: Springer. https://doi.org/10.1007/978-94-017-9688-0.

Brentari, Carlo; Tønnessen, Morten 2024. Introduction to the special issue 'Umwelt Theory and Phenomenology'. *Biosemiotics* 17: 265–272. https://doi.org/10.1007/s12304-024-09583-w.

Caves, Eleanor M.; Nowicki, Stephen; Johnsen, Sönke 2019. Von Uexküll revisited: Addressing human biases in the study of animal perception. *Integrative and Comparative Biology* 59(6): 1451–1462. https://doi.org/10.1093/icb/icz073.

Greggor, Alison, L.; Berger-Tal, Oded; Blumstein, Daniel T. 2020. The rules of attraction: The necessary role of animal cognition in explaining conservation failures and successes. *Annual Review of Ecology, Evolution, and Systematics* 51(1): 483–503. https://doi.org/10.1146/annurev-ecolsys-011720-103212.

Fraser, Julius T. 2001. The extended Umwelt principle: Uexküll and the nature of time. *Semiotica* 134(1/4): 263–273. https://doi.org/10.1515/semi.2001.027.

Herrmann-Pillath, Carsten; Sarkki, Simo; Maran, Timo; Soini, Katriina; Hiedanpää, Juha 2023. Nature-based solutions as more-than-human art: Co-evolutionary and co-creative design approaches. *Nature-Based Solutions* 4: 100081. https://doi.org/10.1016/j.nbsj.2023.100081.

Kirschner, Stefan 2023. The insitutional fate of Uexküll's umwelt theory at the University of Hamburg. *Sign Systems Studies* 51(3/4): 441–512. https://doi.org/10.12697/SSS.2023.51.3-4.01.

Kull, Kalevi 2001. Jakob von Uexküll: An introduction. *Semiotica* 134(1/4): 1–59. https://doi.org/10.1515/semi.2001.013.

Kull, Kalevi 2020. Uexküll studies after 2001. *Sign Systems Studies* 48(2/4): 483–509. https://doi.org/10.12697/SSS.2020.48.2-4.13.

Mäekivi, Nelly 2024. Organisms as agents in zoosemiotic perspective: The case of umwelt reversion. In: Švorcová, Jana (ed.), *Organismal Agency: Biological Concepts and Their Philosophical Foundations*. Cham: Springer International Publishing, 245–261. https://doi.org/10.1007/978-3-031-53626-7_13.

Magnus, Riin; Mäekivi, Nelly 2023. Ecosemiotic analysis of species reintroduction: The case of European Mink (*Mustela lutreola*) in Estonia. *Biosemiotics* 16(2): 239–258. https://doi.org/10.1007/s12304-023-09530-1.

Maran, Timo 2023. Umwelt collapse: The loss of umwelt-ecosystem integration. *Biosemiotics* 16(3): 479–487. https://doi.org/10.1007/s12304-023-09545-8.

Michelini, Francesca; Köchy, Kristian (eds.) 2020. *Jakob von Uexküll and Philosophy: Life, Environments, Anthropology.* (History and Philosophy of Biology.) London: Routledge. https://doi.org/10.4324/9780429279096.

Pollmann, Inga 2013. Invisible worlds, visible: Uexküll's Umwelt, film, and film theory. *Critical Inquiry* 39(4): 777–816. https://doi.org/10.1086/671356.

Schroer, Sara A. 2021. Jakob von Uexküll: The concept of umwelt and its potentials for an anthropology beyond the human. *Ethnos* 86(1): 132–152. https://doi.org/10.1080/00141844.2019.1606841.

Tønnessen, Morten. 2009. Umwelt transitions: Uexküll and environmental change. *Biosemiotics* 2(1): 47–64. https://doi.org/10.1007/s12304-008-9036-y.

Tyler, Tom 2022. *Game: Animals, Video Games, and Humanity.* Minneapolis: University of Minnesota Press.

Uexküll, Gudrun von 1964. *Jakob von Uexküll – seine Welt und seine Umwelt*. Hamburg: Christian Wegner Verlag.

Uexküll, Jakob von 1905. *Leitfaden in das Studium der experimentellen Biologie der Wassertiere.* Wiesbaden: J. F. Bergmann. https://doi.org/10.5962/bhl.title.1133.

Van Dyck, Hans 2012. Changing organisms in rapidly changing anthropogenic landscapes: The significance of the 'Umwelt'-concept and functional habitat for animal conservation. *Evolutionary Applications* 5(2): 144–153. https://doi.org/10.1111/j.1752-4571.2011.00230.x.

This special issue was supported by the Estonian Research Council grant PRG1504 "Meanings of endangered species in culture: ecology, semiotic modeling and reception".