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Applied modelling of semiosphere in interspecific cohabitation contexts

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Abstract: The semiosphere, as theorized by Jesper Hoffmeyer, is an interesting concept for those who want to create tools and models that need to consider a large variety of umwelten interacting and coexisting in the same space. As our contemporary times are witnessing a significant drop in biodiversity, and facing several issues that threaten both our ecosystems as well as human ways of living, the question arises what applications we can really obtain from these tools and models and how they can serve the purposes of sustainability, biodiversity conservation, environmental protection or cohabitation improvement. In this paper, I mainly explore the applications regarding the last-mentioned aspect, and also explain how it impacts the previous ones. I discuss the concept of interspecific cohabitation, listing the different categories of situations that can be included under this common denominator, and detail why this concept is central to understanding and apprehending the contemporary challenges we are facing. The article also observes the kinds of solutions that semiotics, via umwelt perspectives, can offer to improve this cohabitation or solve the issues interspecific contexts can generate.

Keywords: semiosphere; urban environment; liminal species; cohabitation; modelling

1. Cohabitation: elements of context

1.1. Liminal species and interspecific cohabitation

Studies on interspecific cohabitation tend to focus on animal liminal species. These species are defined as neither wild nor domesticated (Donaldson, Kymlicka 2013), which makes them mostly anthropophilic – i.e. animal species that live, evolve and sometimes thrive in contact with the human species and their infrastructures, habitats, waste and ways of living.

These species are central to the question of interspecific cohabitation because they are part of the urban (or peri-urban) ecosystem, which is not always seen as a proper ecosystem, but rather as a place entirely disconnected from nature and

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from any ecosystem, where other species have only ended up either in ways controlled by humans or by accident. The places and roles of these species are more challenged by humans than those of their country counterparts, creating issues and tension that are distinctive of urban contexts.[2] In this paper, the term 'interspecific cohabitation' is more particularly used to talk about situations in which humans and other animal species have to cohabitate in what is their usual and historical ecosystem.[3] The most common examples usually concern species that have been historically considered pests, e.g. *Rattus norvegicus*. However, many species (mostly invertebrates such as insects and molluscs) are endemic to some cities, although they are less studied, except for the citizens' folkloric attachment to them: Paris, for example, has an endemic species of crickets in its subway and several species of snails in its catacombs.

1.2. Biodiversity crisis and the urban context

The interest in studying cohabitation in mostly urban or peri-urban contexts is particularly evident when we look at the current biodiversity crisis. With increasingly fragmented environments and increasingly urbanizing humans who keep expanding their cities, these spaces are becoming essential for other species in diverse and sometimes contradicting ways. They can be sites of contact as the city expands and encroaches on a wild habitat. They can be sites of tension as cities serve as shelters for humans and other animal species with different needs, which can lead to behavioural conflicts as is the case in many cities where smart and hungry birds empty trashcans, creating a messy environment and potential pollution hazards. They can be sites of safety when cities provide shelter and food for species subjected to a lot of environmental pressure in their earlier environments. The Hôtel des Invalides – an Army Museum complex with gardens in Paris – provides a delightful example of this: as wild rabbits have been chased away from

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[2] The model introduced here is not restricted to urban and peri-urban areas (that is, areas of high anthropization, artificialization and human population density). However, it was built with this paradigm in mind and, consequently, was conceived first to address the specific issues of such areas, while being flexible enough to be employable in different contexts of cohabitation with liminals, such as small villages or farmlands.

[3] The question of invasive species can also be seen as a cohabitation issue. However, it will not be developed in this paper, mainly because I will examine the question of interspecific issues between humans and other species. In contrast, the main issue with invasive species will arise, in general, between one animal species and other non-human species in the same ecosystem. With some adjustments, the model could be used to study cohabitation and emotional/symbolic response to invasive species, but at the moment it has not yet been tested in this capacity.

suburban areas and fields, they have found a place where they can now lead a quiet life, roaming freely among the flowers and the grass without being disturbed by tourists since it is forbidden to walk on the grass that is guarded by the military.

In this context, it is essential to remember that urban and peri-urban areas are not human-only territories but complete ecosystems, evolving, exchanging and interacting with the neighbouring ecosystems that have their parts to play in biodiversity management and damage control strategies. These strategies are being developed, especially in countries with a significant share of endemic species (Soanes *et al.* 2023). However, they are still under-used, especially in regions with fastest-developing urbanization regarding which data on both the species and the general ecosystems in urban contexts are mostly missing (Collins *et al.* 2021).

2. How to study cohabitation?

To study cohabitation, we need a strong and relevant modelling of the studied situation. This modelling must have two different scales of relevance: the general overview of the shared semiosphere and the more detailed view of its different elements and components. This will allow us to pinpoint the nature of the cohabitation issues present in the studied situations.

2.1. Modelling the shared semiosphere

The first step in studying interspecific cohabitation is understanding that we have to model a shared semiosphere (Hoffmeyer 1997); otherwise, it is likely that we will only be able to address one aspect of the cohabitation, while missing how the different points of view of the different species and different groups inside each species interact. To do so, we have to use a variety of data and elements ranging from biodiversity censuses to textual analysis, from citizen science programmes data to first-hand surveys or interviews (the details of the study on which this section is based have been published and explained in Delahaye 2023a, 2023b, 2024) that allow us to grasp and understand the different aspects of the shared semiosphere, but can also be used as a guarantee of quality. This means that, since we have to work with data of various origins and natures, obtained using various collection methods, cross-comparison between all the sets is employed to detect lack of consistency between the data. The cross-comparison is based on three aspects:

Consistency: Are the results/data consistent with one another as regards elements that are present in two or more sets?

Gaps: Are there elements present in one set that should also be present in other sets, but are not? What kind of explanations can be proposed to

this? A "gap" situation will appear when no trivial explanation (such as the lack of collecting time or seasonal variation) can be found.

Paradox: Are there elements present in different sets that allow us infer different or even contradictory results about an aspect of the situation?

Since the shared semiosphere has, as much as possible, to take into account the variety of perception, life elements and points of interaction between different species, its modelling implies diversity of data and the shared semiosphere's irreducible complexity, explaining how contradictory elements can sometimes both exist in the same situation. The main aspects of such modelling are, first, documenting and understanding the target animal species' health, behaviour (including potential adaptation of this behaviour to the urban environment in the case of a newly urban species), and interaction with other non-human species. This aspect can be obtained through biodiversity data, usually in two different forms: a very targeted and specialized one (for the behavioural data regarding the target species) and a more large-scale or even comparative one (to understand the general situation of the species in this ecosystem and how the ecosystem functions). The comparison between the two sets must show consistency between them. These data sets will generate the first point of view in the shared semiosphere: the umwelt of the target species, its ecology, physiology and behaviour.

The second main aspect focuses on the interactions between the target species and the human inhabitants and the ways in which the two populations are spread in the city. These pieces of information can be obtained through different programmes of interaction and censuses, for example citizen science programmes (examples regarding the situation in Tartu, Estonia, can be found in Delahaye 2023b, while examples also appear throughout the work led by the CESCO team at the National Natural History Museum in Paris, France). It is essential to gather data from two different kinds of programmes: a quite strictly framed one with scientific supervision (this one can be checked for consistency using the data from the biodiversity data sets, regarding the type of species, their repartition, their census, etc.), and a more open programme that allows inhabitants to register observations and data at free will. The comparison of the latter type of set with the former one, or with data from biodiversity sets, can show whether the inhabitants have a certain bias towards the species (e.g. by recording it poorly due to lack of interest, or by focusing on specific areas of the city where the animal's presence is seen as more problematic). Such a cross between data sets will generate a second point of view in the shared semiosphere: the contact points between the umwelten of the target species, its adaptation and agency, and the inhabitants' umwelten.

The last main aspect focuses on the cultural and symbolic aspects of the cohabitation, the ways in which human inhabitants perceive the target species and the kinds of narratives they develop concerning these. This aspect can be found mainly in textual data (even if, for some cultures, oral transmission may be preferred), which, again, comes in two different kinds: first-hand expressions,[4] that is, how inhabitants express their perception of the species (this set can be compared with biodiversity data to spot gaps and paradoxes between the inhabitants' descriptions and material reality), and second-hand analysis, that is, the way in which scholars and experts of the cultural areas explain some aspect of the first-hand expressions (this data set is important in order to explain some apparent paradoxical situations in the first-hand expressions, that are linked to cultural, linguistic or ethnic specificities). The comparison of these sets with the citizen science data is a good way to detect the impact of emotional and symbolic components on the relationships and interactions with the target species. These data sets will generate a third point of view in the shared semiosphere: the umwelt of the human inhabitants, their material issues, their emotions and their symbolic relationship to the species in question.

Ultimately, the shared semiosphere modelling can look like the schema provided in Fig. 1. It is important to note that, in this case, the presence of gaps and paradoxes between some data sets is not necessarily a sign of poor data quality. Suppose this situation happens between sets with a relationship considered as "paradox-sensitive", e.g. biodiversity data when compared with first-hand textual data. In this case, the cohabitation situation contains signs of the actual existence of paradoxes in the cohabitation situation, meaning that the data are accurate, and what is insconsistent is the situation (a more detailed example is provided below in Section 2.2). Of course, paradoxes or gaps could appear between sets that are supposed to be consistent with each other, for instance two different sets of biodiversity data. This is a sign that something is out of the ordinary (maybe some data are obsolete or incomplete) and that these sets must be replaced or that fresh new data must be collected in the field. However, such situations did not occur in the two projects in which I employed this method, showing that it is not excessively difficult to find pre-existent sets.

[4] The nature and method of acquisition for this set can vary depending on what is relevant to the situation: interviews with specific stakeholders, general audience questionnaires, collecting formal complaint letters sent to the local government and officials, local folklore, art production if the species forms a particular and recurrent symbolic pattern etc.

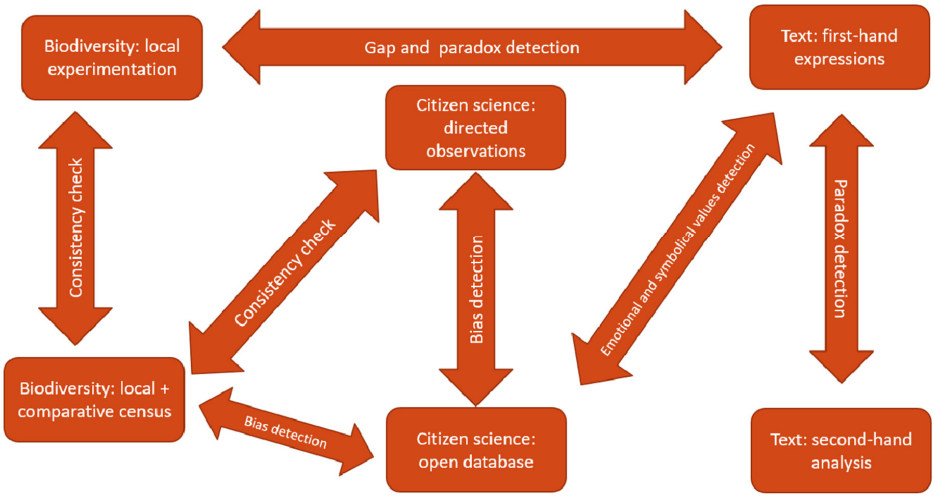

Figure 1. The different sets of data involved in the shared semiosphere model (Delahaye 2023b).

2.2. Different components of the umwelt and how they appear in modelling

What components of the umwelt are we mapping with these data sets, and how are they organized in the modelling? Mainly, they allow us to grasp three different components of the umwelten of both the human inhabitants and the target species: materiality (factual elements such as actions, physical interactions or physiological needs), emotional value[5] (emotional elements such as individual relationships, feelings toward a species or emotional experiences) and symbolic value (collective and individual elements of history, representations or beliefs). These different components emerge from a comparison between the different data sets. For example, the paradox between data from the biodiversity set and the data from the first-hand expression set will indicate that an aspect of the materiality of the cohabitation situation is deformed or hidden by another element from another, emotional or symbolic component. In a general way, the emergence mechanism is illustrated in Fig. 2, but the following is a concrete example from the project made in Paris:

[5] If it is possible to evaluate the emotional value in a large group of species (signs of stress or confidence, friendly behaviour towards humans, hostility towards pets, etc.) in some situations, this aspect will only be relevant for the human inhabitants. Symbolic value was, in the previous project, only relevant for the human species. However, it should not be excluded, should the model be used for the study of cognitively highly complex species like cetaceans or apes.

- biodiversity data (here, data from veterinarian services) showed that no health hazard had been recorded in the last years in the food and catering sector regarding the presence of rats;
- on the other hand, the vast majority of citizens' complaints (textual data, first-hand expression) concerning rats targeted the health hazards in places selling food; even though the inhabitants of the city did not personally know anyone who would have fallen ill from that cause, they were absolutely sure that the problem existed;
- the paradoxical discrepancy between these two sets tended to indicate that there was an issue concerning not the material, but the symbolic aspect;
- to test this hypothesis, a survey was conducted among a group of inhabitants, the results of which showed that they had an unequivocal and definitive opinion regarding rats' characteristics, which were seen as considerably more negative than the characteristics of mice, even though the informants were not sure of their ability to distinguish between the two species, especially under the conditions of a "natural" encounter (i.e. in one that occurred briefly, by surprise, mainly in the dark, etc.);
- this indicated that inhabitants were not victims of "real" rats' nuisances, but of a "symbolic" rat problem that only partially overlapped with the real one. What was at stake here was a symbolic issue.

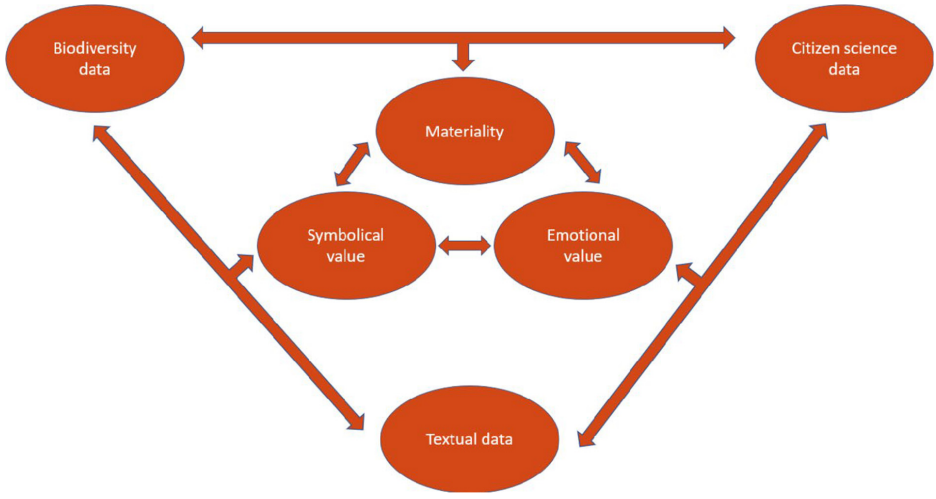

Figure 2. Emergence of different values from the data sets (Delahaye 2023a).

The primary benefit of modelling these different values lies in the fact that it will allow us to understand cohabitation in an urban context from other perspectives, in order to map interactions more thoroughly and see how cohabitation issues work. It is possible, for example, that nuisance expressed as material by inhabitants will, in fact, turn out to be an issue in the emotional aspect only, without the inhabitants being aware of this.[6] In the example given above, people were really distressed by the presence of rats, not because they were actually exposed to a health hazard, but because they were convinced that they were, which was a psychological nuisance. Mapping the different elements constituting the umwelten of the participants in a shared semiosphere, in the context of cohabitation, makes it possible to propose and classify various cohabitation issues, detect where these are coming from and, in the end, suggest how to help solve them.

2.3. Different cohabitation issues

In the context of problematic cohabitation between humans and liminals, modelling the semiosphere by grouping and relating the different umwelt elements allows us to bring to light different types of problems, which hitherto have often escaped standard cohabitation diagnosis.

- Displacement of material nuisances (e.g. destruction of materials, goods or crops, biohazards, aggressions): the actual material nuisances are not those described by citizens, and the solutions implemented need not resolve the nuisance problem (Jiguet 2020). This can generate increasingly more radical responses, harmful to the conservation of species. An example of this appeared as one of the main results of the project on rats (Delahaye 2021) in which the inhabitants were strongly assuming that nuisances linked to the catering sector would be the main ones, while the problem was actually almost non-existent, yet they ignored nuisances linked to the car sector in which this issue was a major and costly one.
- False narratives regarding nuisances. The material nuisances described do not correspond to field observations, but rather to "imagined" nuisances based on the symbolic charge that the species has for the inhabitants. Awareness or communication solutions can make it possible to recover a situation favourable to both biodiversity and human development. The CESCO team faced this situation when citizens described crows attacking babies in their cribs, a complaint without any basis in reality.

[6] At no point in this model is the hypothesis made that the informants are lying. Although this can, of course, happen from time to time on an individual scale, there is no reason to observe that aspect on a collective scale. Most of the time, a paradoxical situation will emerge from a false belief, lack of knowledge, an unconscious opinion or a strong emotional reaction.

- Non-material cases of nuisances. The nuisances described are of a symbolic and/or emotional nature, a traditional material solution is not suitable and alternative measures (cultural, narrative, social, etc.) must be found to meet the needs of the inhabitants. In the case of rats, some inhabitants are in this situation when they explain that they know that rats are in fact harmless, but cannot help finding them scary and disgusting, being distressed by their very presence.
- Challenging of narratives offering solutions. Nuisances can be solved materially and ecologically, but emotional/symbolic obstacles may make adopting and implementing solutions complex. This situation was faced by the CESCO when experimenting with ways to solve the nuisances caused by crows in a botanical garden (Lequitte-Charransol, Jiguet 2021): their solution was rejected because it involved letting some parts of the garden grow in a way that was perceived as neglected.
- Erroneous perception of nuisance/benefit balance. The impact of nuisances is overestimated compared to the ecological benefits of cohabitation, which may be more subtle, less noticeable or evolve over a different time scale, so that we must raise awareness among the inhabitants to preserve these benefits. This situation concerns any scavengers fulfilling a critical ecological role. However, it can also concern insects, that are not taken into consideration as much as mammals or birds when talking about biodiversity and ecological services (Villarroya-Villalba *et al.* 2021).

Some cases are mutually exclusive, for instance the displacement of material nuisances with a non-material case of nuisances. However, in most cases, a situation of cohabitation can present several of the issues discussed above. Pinpointing them is the first crucial step before trying to solve the situation and improve interspecies cohabitation.

3. Applied modelling in improving cohabitation

The aim of this modelling work is to be applied for cohabitation improving. To do this, we will need to understand what kinds of solutions such modelling can propose that are new, how to apply them in field situations, and what kinds of improvements can be expected through this application.

3.1. To what kinds of solutions can umwelt modelling lead

As we model the cohabitation situation, we can clearly see that every case of cohabitation, especially if it is an interspecific one, is an attempt at the coexistence of different umwelten. In this acceptance, it is also important to note that cohabitation can turn sour and present problems ranging from minor issues to significant ones if an aspect of the umwelt of a stakeholder is threatened or disturbed, no matter what this aspect is.

It is important to grasp this notion, as the majority of solutions proposed to solve cohabitation issues tend to target material aspects, with material solutions that often turn out to be coercive (traps, poison, barriers, fences and repellents of various kinds), even if these are not effective (Jiguet 2020). Solutions proposed simply tend to push some stakeholders away to release their perceived pressure on the umwelt of other, mainly human, inhabitants of the space. In fact, these are rarely cohabitation solutions.

Modelling the umwelten of the different stakeholders can lead to other kinds of solutions. Some of these can still be material ones. However, the starting point could be a different umwelt, i.e. rather than chase away or exterminate a species that causes nuisances, we could adopt the point of view of the said species and understand why it behaves the way it behaves which seems to cause a nuisance. Then alterations can be made, not to the species, but the environment, in order to let the target species adopt a different behaviour, one that is still ecological and ethologically relevant, but does not cause interference with other species already present in the environment. The example of rat management based on trapping and poisoning versus one based on trash and waste management is an excellent example of this strategy. Other solutions can exist for birds (Lequitte-Charransol, Jiguet 2021), and more studies on such a way of solving issues are likely to emerge with the growth of data showing how in reality coercive solutions tend to have a high cost and a poor efficiency (Jiguet 2020; Mägi 2017[7]).

Another category of solutions includes the semiotic ones, which are thought to target the emotional and symbolic aspects of cohabitation. The first step to adopting this kind of solution consists in correctly identifying a cohabitation issue as belonging to (at least) one of these categories, which is still not very common and widespread. The modelling of the different umwelten involved is a necessary step

[7] Mägi, Marko 2017. *Vareslaste monitooring Tartus. Tartu Linnavalitsuse ja Tartu Ülikooli vahelise teadus- ja arendustöö tellimuslepingule nr M-030 lõpparuanne.* [Monitoring of corvids in Tartu.]Tartu Ülikool Ökoloogia ja Maateaduste Instituut, Zooloogia osakond. can be found at https://tartu.ee/sites/default/files/research_import/2018-01/Vareslaste%20monitooring%20Tartus_l%C3%B5pparuanne%2C%20leping%20M-030.pdf.

towards understanding where the actual problem lies and towards beginning to create semiotic solutions.

3.2. What are semiotics solutions, and why try to implement them

Semiotic solutions are solutions addressing the way in which some beings create, from the presence of other beings as well as their behaviour or the interactions they are having with them, a meaning that in itself is detrimental to a healthy interspecific cohabitation.

In situations where previous standard attempts at solving issues have failed, it is worthwhile trying to implement semiotic solutions, as these address aspects of the umwelt that are different from mere material nuisances and can be an efficient way to treat the emotional or symbolic levels of cohabitation.

There are different categories of semiotic solutions:

- Fighting false beliefs. This is a helpful solution in situations with inconsistent symbolic and material aspects. Awareness programmes and popularization belong to this category of solutions, aiming toward consistency between what the cohabitation situation is and what inhabitants think it is – cf. the situation in which inhabitants thought that rats as pests endangered catering, when in fact the major nuisance occurred in the automobile sector (Delahaye 2021).
- Involving the inhabitants. This is a solution for situations in which the target species is (almost) non-existent in the symbolic and emotional spaces of the inhabitants. Consequently, actions toward the study or the protection of the species can be difficult, and the inhabitants may remain uncooperative. This category of solutions is compounded mainly by programmes of citizen science, participative science, and academic science in cooperation with the local population, e.g. some programmes of crow monitoring led by the CESCO team, and the communication related to them (Le Guilcher, Royer 2023).
- Creating a symbolic bond. This is a solution for situations where the material nuisances are minor, and the species has a negative emotional value, inducing fear or disgust. Depending on the local context and the inhabitants' culture, this category of solutions can include awareness programmes focused on ecosystem services (what the species is doing for us, what its place is in the ecosystem, how it allows some plants to bloom or prevents some less appreciated species to proliferate) and rehabilitation of old and/or exotic symbolic use (e.g. Norse mythology in case of the crow or the Chinese zodiac in case of the rat).
- Creating an emotional safeguard. This is a solution for situations where the material nuisances are minor, yet the species has a strong negative symbolic value for the inhabitants, and they are consequently prone to request that radical measures be taken against it. In such a situation a material solution is

not necessary, and inhabitants can be dissuaded from requesting such radical treatments by creating empathy and emotional bonds towards the species. Depending on the context, this could happen by popularization programmes (explaining how sentient/playful/sociable/protective a species is), direct interactions (presenting tamed specimens to the inhabitants to let them interact and create bonds with a representative of the species), artistic production (writing letters, shooting short movies or coding video games from the point of view of the species). Empathy is a powerful feeling, and it often suffices to overpower false beliefs and negative symbolic values (Delahaye 2021).

– Proposing new narratives. This is a solution for situations in which both emotional and symbolic values are negative, yet material nuisances are nevertheless minor. In such a case, it is crucial to propose different narratives to allow the inhabitants to develop a more empathic relationship with the species and attribute a more accurate symbolic value to it. Creating new narratives is a collective work and needs widespread diffusion. The best example is the "Ratatouille effect" (Delahaye 2021). In this situation, the global population has a very strongly negative relationship with a species both on the emotional and symbolic levels (here the Parisians and the rats are involved), except a particular age group who has a much more positive relationship with the species (the age group who were kids when the animated film *Ratatouille* was first screened in France, which proved the best ever debut for an animation).

Semiotic solutions address the different stakeholders' meanings, perceptions, and interpretations. By doing so, they are meant to reshape the stakeholders' umwelten to make them more compatible with, rather than imposing physical and ecological constraints on, one or several species, to make coexistence more conformable for the umwelt of human inhabitants. From this perspective, semiotic solutions are actual cohabitation solutions. In the current context of ecology, climate and biodiversity crises, they are interesting in their ability to change the definition of what is a sustainable way to create coexistence between liminal species and human inhabitants, and how cohabitation can be improved.

3.3. Which kind of improvement is expected

Modelling the shared semiosphere and the variety of umwelts that constitute it is a complex task, requiring time, expertise, a pretty important variety of data, and sometimes collection work to obtain missing elements. The question might arise why we should do that instead of continuing to solve cohabitation issues as we are already doing.

The first answer is that currently we are often not solving cohabitation issues: we are suppressing cohabitation in order to suppress the issues coming with it. Such a way of addressing ecosystem problems is not sustainable. As cities expand and natural environments shrink and fragment, wild species tend to move closer and closer to human habitats, some of them becoming liminal species. Cohabitation cases are expected to become more and more numerous as the pressure on ecosystems is worsening. We will have no other choice at some point (and for some humans, this is already a daily reality) than to coexist with other species, even quite dangerous ones (Athreya *et al.* 2013). The tools for that must be ready.

The second answer is that the solutions we are using today are simply not working: crows are not afraid of repellents (Mägi 2017); killing them is of no more use; nor is killing of foxes (Jiguet 2020); cities are massively poisoning their rats who can still be found everywhere, while this method is creating considerable suffering in a sentient species (Mason, Littin 2003). Often, such inefficiency is linked to a considerable proneness to harm other fragile species, especially among predators such as the owl family [Barn Owl Trust (Great Britain) 2012)]. It is necessary to understand that cohabitation is a phenomenon that exists on different levels, while the material one is only one of them. Semiotic models, tools and methods are suitable materials to address the other levels and create more efficient solutions.

The third answer is an indirect, but nevertheless important one. In order to map a shared semiosphere, to model the umwelt of another species, we need to study the species, adopt its point of view, understand how it perceives the world, what creates meaning for it and what does not, how it interacts with the environment, with other species, with us. This shift in the point of view has been sorely lacking in the past decades and is one of the (probably many) reasons we let all these crises happen. Adopting a model of this kind – not necessarily this one, but one of the same type – is becoming a vital necessity in order to avoid trying to find solutions with the same biases with which we created the problems.

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Modélisation de la sémiosphère appliquée au context de la cohabitation inter-espèces

La semiosphere, telle que théorisée par Hoffmeyer, est un concept riche et intéressant pour qui désire créer des outils et des modèles devant prendre en considération une large variété d'Umwelten interagissant et cohabitant dans le même espace. Alors que notre époque actuelle doit faire face à une chute sans précédent de la biodiversité et à de nombreux défis menaçant tant les écosystèmes que certains modes de vie humains, il est intéressant de se demander quelles solutions concrètes nous pouvons espérer obtenir de ces outils

et modèles, et comment ils peuvent se mettre au service de la durabilité, de la protection de la biodiversité et de l'environnement ou encore de l'amélioration de la cohabitation. Dans cet article, j'explorerai principalement les applications concernant ce dernier aspect et exposerait comment celui-ci joue aussi fortement sur les aspects précédents. Je discuterai du concept de cohabitation interspécifique, en listant les différents types de situation qui peuvent se retrouver sous cette dénomination commune, et détaillerai pourquoi ce concept est central dans la compréhension des défis auxquels notre monde contemporain doit faire face, ainsi que le type de solutions la sémiotique, à travers les perspectives de l'Umwelt, peut offrir pour améliorer cette cohabitation ou résoudre les conflits qu'elle génère.

Semiosfääri rakenduslik modelleerimine liikidevahelise kooselu kontekstis

Jesper Hoffmeyeri teoreetilises tõlgenduses on semiosfäär huvitav mõiste nende jaoks, kes soovivad luua tööriistu ja mudeleid, mis peavad arvestama ühes ja samas ruumis koos eksisteerivate ning üksteist mõjutavate omailmade suure paljususega. Et meie kaasaeg on tunnistajaks elurikkuse märgatavale kahanemisele ning meie ees seisab mitmeid probleeme, mis ähvardavad niihästi ökosüsteeme kui ka inimeste eluviise, tõstatub küsimus, milliseid rakendusvõimalusi sellised tööriistad ja mudelid meile tegelikult pakuvad ning kuidas need saavad aidata kaasa selliste eesmärkide saavutamisele nagu jätkusuutlikkus, elurikkuse säilitamine, keskkonnakaitse ja kooselu parandamine. Artiklis vaatlen peamiselt rakendusi, mis puudutavad viimati mainitud aspekti, ning selgitan ühtlasi, millist mõju see avaldab eelnenutele. Käsitlen liikidevahelise kooselu mõistet, loetlen erinevaid olukorrakategooriaid, mida on võimalik koondada selle ühise nimetaja alla, ja vaatlen üksikasjaliselt, miks see mõiste on kesksel kohal, meie ees seisvate kaasaegsete väljakutsete tajumises ja mõistmises. Artiklis pööratakse tähelepanu ka seesugustele lahedustele, mida semiootika saab omailmavaatenurki kasutades välja pakkuda, et kooselu parendada või liikidevahelistes kontekstides tekkida võivaid probleeme lahendada.