

WORKPACKAGE 1 – BIODIVERSITY AND PERCEPTION

DELIVERABLE 5 – THEORETICAL TOOLKIT FOR COHABITATION ISSUES

CONTEXT

GENERAL CONTEXT

In context of urban biodiversity, it is crucial to compare and confront biodiversity's data with human perception, to understand how these two aspects interact (as in Deliverable D4). Taking these multiple aspects into account to describe with the highest possible level of details a complex semiotical situation can also allow to find ways of improvement of the situation. Considering humans and liminal animals as part of a common semiosphere, different kinds of improvements can be suggested (sensitization, urbanism changes, biodiversity monitoring, reintroduction programs etc.).

Yet, before building a solution, like a sensitization's plan can be, it is important to have to right toolkit to describe the situation, map the semiosphere correctly and, in a certain way, diagnose the different issues the cohabitation is facing.

In this project, the world "semiosphere" is used in the sense described by Hoffmeyer "a sphere just like the atmosphere, the hydrosphere and the biosphere" (Hoffmeyer 1997).

INSIDE THE PROJECT

This project partially followed the methodology set for a previous study (Delahaye 2021) of another urban species (*Rattus norvegicus*) in another urban environment (Paris, France). This study showed that it is possible to learn a lot of things about relationship between humans and liminals by comparing semiotic representations to factual data.

The present step is focused on using the previous comparative analysis (Deliverable 4), that sums up the results of Deliverables 1 to 3, in order to propose a theoretical toolkit for potential sensitization's plan, regarding the cohabitation with liminals.

RESEARCH QUESTION AND HYPOTHESIS

QUESTION AND SUBQUESTION

This deliverable is part of the Case study 1, aiming to study the relationship between biodiversity and perception of such biodiversity on different semiotic levels. The main question of this Case study is: What are the roles of liminal species in a human city?

The comparative analysis based of Deliverable 4 aims more specifically to answer to the question: How to properly take into account the different aspects of the liminals' semiosphere in order to improve the cohabitation between them human inhabitants?

HYPOTHESIS OF THIS STEP

The hypothesis of this step is closely related to the general hypothesis of Milestone 1. By producing a theoretical toolkit, addressing all the different aspects of cohabitation exposed in Deliverable 4, this step aims to propose semiotical tools, maps and solutions to cohabitation issues between liminals and human inhabitants in cities.

METHODOLOGY

METHODOLOGICAL CHOICES

The theoretical toolkit is mainly based on the analysis produced in Deliverable 4. It takes into account the methodological choices made in the three first deliverables of Workpackage 1 (Deliverables 1, 2 and 3). The methodology focuses on four points.

- Evaluating the materiality of the cohabitation situation: this point was covered by Deliverables 1 and 2, and requires different sets of data enabling the investigator to have an overview of the health, repartition and stability of the species involved in the cohabitation.
- Gathering the different emotional implications: this point was covered by Deliverables 2 and 3, and requires different sets of data with strong involvement of the inhabitants, in order to transmit the different emotional values they can put on the species they are cohabitating with.
- Understanding the symbolical roles: this point was covered by Deliverables 1 and 3, and requires the confrontation of the most factual set of data with the most subjective one, in order to evaluate the gap between the two, and to reveal the potential symbolical value explaining such a gap (multiple gaps, corresponding with different symbolical values, can be found).
- Linking the different elements to correctly map the semiosphere: this point was covered by Deliverable 4, and requires to put together the three previous aspect in a semiotically coherent way, in order to propose a “map” of the semiosphere involved in the cohabitation situation.

ISSUES AND PROBLEM SOLVING

Different issues appeared at different points of the work, but two of them can be generalized to any city or species potentially studied:

- **Linguistic issues:** programs of citizen science and textual corpus are usually in the mother tongue of inhabitants. This linguistic proximity is necessary to get people involved in citizen science program or to have them express in an easy and fluent way their opinions, emotions and beliefs regarding the species they cohabit with. Linguistic issues can also occur in scientific reports, if the study was seen as too local to be of international interest, and was consequently not written in English or not translated.
- **Data access issues:** this kind of work requests to gather a large amount of various data, and they are not always easy to find, to access, or simply to know that they exist.

For both issues, the only possible way of solving is to add to the study local researchers and/or native speakers, that will be able to translate interesting data or to investigate with much more efficient a possible source of information. Due to the multiplicity of the nature of the material, there is currently no automatic or informatic way to solve these issues.

POINTS OF VIGILANCE

When trying to generalize the methodology of the study to different contexts (different cities, different human cultures, different species), some points of vigilance will require particular and careful attention from the investigators:

- **Difficulty to follow specific group or individuals:** most of the liminal species are not scientifically followed and do not wear any identification system. Depending of the nature of the studied species (flying, living underground, hibernating etc.), different strategies of following, more “traditional” should be used to try to compensate this aspect.
- **Lack of data about other species involved:** semiosphere is a sum of complex interactions between various of species. When studying liminals, the lack of data regarding other species of liminals can be problematic.
- **Naming errors:** general public is not specialist. Any data coming from inhabitants (textual documents, interviews, citizen science inputs etc.) can include naming errors.
- **Geographical bias:** inhabitants are more sensitive to what is close to their living area. Registration of species, complains about overpopulation or nuisances etc. can suffer from an inaccurate geographical description.
- **“Remarkable” bias:** general public is more sensitive to what is new for them. Rare species are more registered than common one, aggressive behaviour is more related than normal one etc. and description may not be accurate to understand the reality of the interactions.
- **Resistance of semiotic links:** all semiotic relationships are not of equal resistance. This must be taken into account when investigating semiotic solutions in order to solve cohabitation issues (see Interpretation section).

RESULTS

RAW RESULTS

MATERIALITY

The materiality of the situation is a necessary step to understand the factual reality of the situation studied. It aims to answers to following questions:

- What is the health of the population? Are the individuals numerous enough? Are they able to act in the different aspects of all their natural behaviour?
- Are there areas where they are located or are they spread?
- Are there immediate dangers that can be spotted easily (population declining, toxic environment or alimentation, inability to nest or reproduce, conflict with other species)?
- What are the other species that must be taken into account when studying the situation (because they are preys or predators, or trying to occupy the same ecological niche, or they are endangered or invasive and measures taken about them will affect the studied species)?

In order to avoid the first five risks listed before (see Points of vigilance section), it is recommended to gather data from different sources and of different nature, like scientific studies and citizen science programs. For all data sets, listed risks must be checked before integrating the set to the mapping.

The access to some data can be an issue at this point, due to the general tendency to withhold information when results are not yet published.

SYMBOLICAL VALUE

The symbolical value aspect measures the different symbolical and cultural aspects of the relationship between human inhabitants and the studied species. This symbolical value can be an unconscious mechanism. Studying this aspect aims to answers to following questions:

- What roles play the studied species for the inhabitants?
- Do the inhabitants and the species have an important common history (hunting, diseases transmitted, animal-emblem etc.)?
- Is the studied species a particular symbol of something important in the culture of inhabitants (deity avatar or messengers, emblem of an invader etc.)?
- How is the studied species described? Is this description coherent with factual data about the biology or the behaviour of the species?
- Are there myths, legends, folklore, popular stories etc. revolving around the studied species?

This aspect is sensitive to biases 3, 5 and 6 of the Points of vigilance section. Inhabitants can have very strong symbolical representation of a species without being able to correctly identify it, and therefore can be talking about their experience with species while a completely different one is in fact involved. They are also more prompt to remember exceptional by remarkable events or individual, and to create their entire symbolical representation based on that. Symbolical relationships are particularly strong, and when presented with scientific evidences, this kind of semiotic link will resist (see in the Interpretation section about Gap and Paradox).

For evaluating this aspect, very factual data (like scientific studies) must be confronted to productions allowing inhabitants to express their symbolical world (textual data are particularly recommended, in literature to understand the cultural background, but also in more informal ways like blogs, to understand the current weigh of this cultural background). The last kind of data is particularly vulnerable to linguistic issue, and will require a local (for the cultural aspect) and/or native (for the fluent language understanding) investigator in the project.

EMOTIONAL VALUE

The emotional value aspect measures the different emotional and emphatical aspects of the relationship between human inhabitants and the studied species. This emotional value can also be an unconscious mechanism. Studying this aspect aims to answers to following questions:

- How are the inhabitants feeling about the species?
- What kind of vocabulary, linked to which emotions or concepts, are they using to describe them?
- What roles do the inhabitants think they play for the species?
- Are the inhabitants expressing particular values about the species (spiritual value, aesthetic value, memorial value etc.)?

This aspect is sensitive to the four last biases of the Points of vigilance section. Inhabitants can have very strong emotional experience with a species without being able to correctly identify it, and therefore can be talking about their feelings about species while a completely different one is in fact involved or while they are in fact generalizing a particular aspect to all the species looking alike. They are also more prompt to remember exceptional by remarkable events or individual, especially if they were scared, and to create their entire emotional representation based on that. It is important to note that close species (like mammals) will also more easily create empathy in inhabitants than more distant species (especially arthropods). Like the symbolical ones, emotional relationships are particularly strong, and can even be in contradiction with the symbolical relationship in a same individual (see in the Interpretation section about Paradox).

INTERPRETATION

CONSISTENCY

Materiality, symbolical value and emotional value can then be compared in order to map the different semiotic relationships inside the studied semiosphere.

When two aspects are consistent together, two main things should be concluded:

- These elements are solid ones. Future decisions, action's plan or scientific or popular programs can be based on them.
- If necessary, like in the situation of a sensitization program, these representations can be modified by scientific evidences.

Consistent relations are necessary. If the three aspects have no consistent elements which each other, there is most probably a problem of methodology, especially in the representativity of the chosen sets of data, or in the interpretation of those sets.

GAP

When two aspects are somewhat overlapping but some elements are missing on one side of the other, it is possible to call it a gap.

When two aspects present gap, two main things should be concluded:

- These elements are working together, otherwise they won't be overlapping.
- More investigations are needed to understand the reason of the gap (it can be the lack of data, but also the lack of interest of the inhabitants about a specific aspect of the species, or the loss of a previous relationship due to an historical event interrupting the transmission between human generations or a biological event, like the extinction then reintroduction of the species, interrupting the relationship with the species).

Gaps are not necessarily an issue in the results, only the sign of a lack of information. Understanding the reason of the gap is more important in this situation than understanding what should be there (partially because, if it is due to a lack of interest, nothing else should be there).

PARADOX

When two aspects are coexisting in the same reality (for example, they are both consistent with the third aspect) but are yet contradictory, it is possible to talk about paradox.

When two aspects create a paradox, three main things should be concluded:

- At least one of these aspects is in situation of resistance of the semiotic link, and will be impervious to scientific evidences or attempt to change the perception of the inhabitants.
- If, after investigation, both of these aspects are in situation of resistance of the semiotic link, then it should be possible to work with one aspect in order to influence the other (for example, people having a strong negative symbolical value of a species but also a strong empathy toward it can be sensitized through their emotional canal in order to influence their symbolical perception).
- A paradox is a major point of a study and should be investigated in priority.

Paradoxes are where different aspects of the same semiosphere are coexisting on the same plan. They are the signs of very complex relationships towards another species and are great entry points for action's plans, sensitization programs or popular science events.

MILESTONE 1 – PROGRESS REPORT

IMPACT OF RESULTS

These results will allow the creation of more practical tools (like it is expected for Exploitation 1), but will also indicate points of vigilance, elements of interest or ambiguous aspects that could, and probably should, be items or questions for surveys or interviews in Workpackage 2.

In a more general view, results of Deliverable 5 should be seen as subjects to change, depending on how results from Workpackage 2 will confirm or contradict some of the most fragile aspects.

ISSUES, PROBLEMS OR LACKING

Three main issues are remaining, that probably can be solved in next Work packages:

- Lacking in behaviour's knowledge: corvids in the city are not very well studied apart from the nuisances' evaluation. The lack of markings (through leg rings for example) is making difficult to follow them through the year. Hopefully, elements from Workpackage 3 will improve this issue.
- Language problems in textual material: the textual material is clearly underexploited in this study due to language barrier. Survey and interviews in Workpackage 2 may help to gather more complementary resources.
- Issues with citizen science database: the main citizen science database has issues that were detailed in Deliverable 2. These issues were taken into account as much as possible, but can still be improved by elements of Workpackage 2 regarding their use by the general public.

NEXT STEPS

The theoretical part described in this deliverable is in an attempt to produce a theoretical basis that could be reused in another city. A more practical document will be created in Exploitation 1, to be concretely useful in Tartu and to take into account the particularities of this city, its aesthetics and its inhabitants.

The next major step will be the redaction of the Milestone 1 report, which will sum up the entire work done during Workpackage 1.

GENERAL PROJECT – CURRENT STATE OF PLAY

IMPACT OF RESULTS

These results are an important part of Workpackage 1, as they can be seen as the theoretical material produced by the WP1 that can be used outside of the project. These results, combined with Deliverable EX 1 and the paper linked to Deliverable P1, are the final production of the case-study 1.

In order to produce more precise, detailed and useful content, these results will be the first inputs used in Workpackage 2.

PROPOSITIONS FOR OTHER ASPECTS OF THE PROJECT

ACADEMIC ASPECTS

These results are the main material composing and leading to the first scientific publication of the project (see document P1).

As for Deliverable D4, these results will also be partially used in a communication at the Gatherings in Biosemiotics 2022 conference (see document C1). They will probably be partially included in an international presentation (see document I1) for the French Society of Zoosemiotics (see link in the References and links section, in French).

POPULARIZATION ASPECTS

The potential introduction of these results to the French Society of Zoosemiotics can also be twined with a conference for general public (as this kind of event is already organized by the society).

These results are also the theoretical side of a two-faces work, and a more practical and directly usable toolkit will be created after it (see document EX 1).

NEXT STEPS

These results are closing the Workpackage 1, leading to two next steps. The first one is the redaction of the summary report for Milestone 1, and the second is the launching of Workpackage 2 (Workpackage 3 being a work-in-progress for the full length of the project).

ANNEXES

LINKS AND REFERENCES

REFERENCES

Delahaye, Pauline. 2021. 'Rats, Mice and Humans'. *Linguistic Frontiers* 4 (1): 44–52. <https://doi.org/10.2478/lf-2021-0004>.

Hoffmeyer, Jesper. 1997. *Signs of Meaning in the Universe*. Indiana University Press.

LINKS TO WEBSITES AND DOCUMENTS

Société Française de Zoosémiotique: <https://societefrancaisedezoosemiotique.fr/>

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The notion of “resistance of the semiotic links” was suggested by Kalevi Kull during a department meeting, in order to explain more clearly the results introduced.