Codes and interpretation in perception

Morten Tønnessen

Associate professor at University of Stavanger's
Department of health studies

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Theoretical outlook

- **MY OUTLOOK:**
- Philosopher & semiotician – MA in philosophy of biology etc (Univ. of Oslo); PhD in semiotics/philosophy (Univ. of Tartu)
- Umwelt theory
  - Uexküllian phenomenology
  - Semiotics of being
- Human–animal studies; human ecology

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Task

- Marcello correct in stressing that we must not commit the mistake of claiming that *everything* is **codes** (nor the mistake of claiming that *everything* is **interpretation**)

- **Therefore the following task is crucial:**

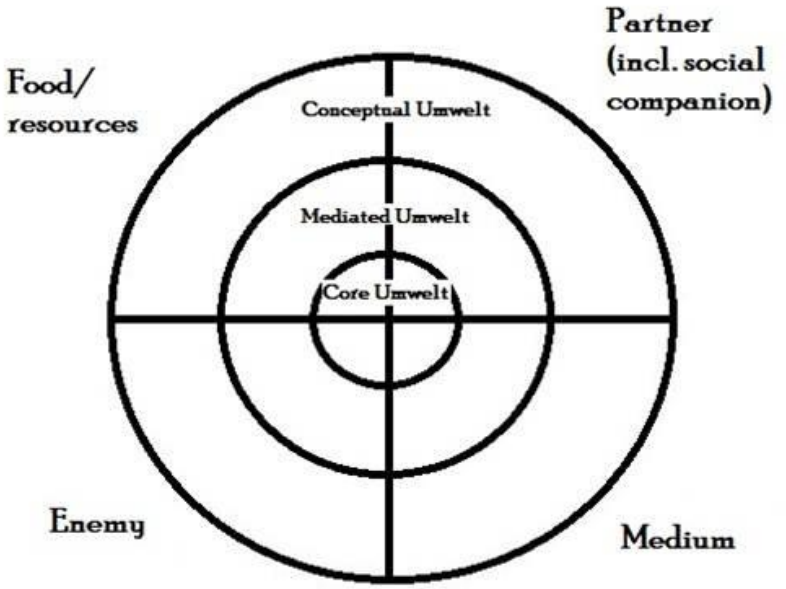
- Outlining the complimentarity of coding and interpretation

Notion of perception

- In this talk I present work in progress on the role of **interpretation** vs. **coding** in perception, where **perception** is understood in terms of coherent (unified) subjective experience. I follow Jakob von Uexküll (1956, cf. 2010) in assuming that all organisms except plants and fungi have such coherent, unified subjective experience (i.e. Umwelt experience).
  - Plant and fungi are endowed with phenomenal worlds of a more diffuse kind (Uexküll called them 'Wohnhüllen')

The tripartite Umwelt model

- My starting point is the **tripartite Umwelt model** (Tønnessen 2011), according to which any Umwelt has two aspects (core and mediated) and some have three (including conceptual).
- I theorise that these three layers interact dynamically so that one or two of the layers are occasionally temporarily suspended (in other words, perception is subsequently focused – more or less exclusively – on different Umwelt layers).



Definition of core Umwelt

- By *core Umwelt*, I mean the aspect of Umwelt within which one interacts directly and immediately with other creatures or Umwelt objects, in (to use a figure of speech) “face-to-face” encounters.*

* However, in all normal instances, i.e. whenever the perceiver e.g. is capable of having memories or at least is capable of anticipating events, our actual encounters with others involves mediation, and thus the mediated Umwelt, as well. Only in exceptional cases, in consequence, are "face-to-face" encounters located *solely* within the core Umwelt.

Definition of mediated Umwelt

- By *mediated Umwelt*, I mean the aspect of Umwelt in which Umwelt objects are encountered indirectly by way of some mediation (memory, fantasy, anticipation, modern media, etc.).

  – I suggest that this particular aspect of Umwelt can generally be associated with Uexküll's notion of the *Suchbild*, the *search image* (cf. Uexküll 2010: 113–118).

Definition of conceptual Umwelt

- By *conceptual Umwelt*, I mean the aspect of Umwelt in which one navigates among Umwelt objects in terms of predicative reasoning in general or human language in particular.

- **Further theoretical development**
- In Tønnessen, forthcoming, I outline the workings of the Umwelt in terms of these three aspects in more detail.
- We can generally conceive of six types, or categories, of acts, and these can be located within the three different aspects of the Umwelt:

The tripartite Umwelt model

- **Core Umwelt**
  - Automated acts of perception
  - Automated mental acts
- **Mediated Umwelt**
  - Wilful acts of perception
  - Wilful mental acts
- **Conceptual Umwelt**
  - Habitual acts of perception
  - Habitual mental acts

The tripartite Umwelt model

- By ***automated***, I mean the exact and physiologically based matching of something with something else.
- By ***wilful*** I mean the agenda- and interest-driven matching of something with something else.
- By ***habitual*** I mean the learned matching of something with something else.

- Whereas ***conscious animals*** carry out all six types of acts, non-conscious creatures, in so far as they perceive, only carry out two, namely automated and wilful acts of perception.
- Habitual, i.e. conceptual acts are reserved for conscious creatures, but even bacteria can carry out wilful acts of perception, i.e. make choices based on interpretation.

Revisiting the notion of conceptual Umwelt, and predicative reasoning

- By **predicative reasoning**, I mean the habitual, mental act of ascribing a specific feature to someone or something.
- Animals that ascribe specific features to other living beings or objects via mental acts are arguably capable of carrying out a fundamental form of logical reasoning.
- An animal's capacity for predicative reasoning can be more or less advanced and complex.
- As we see, we can define the conceptual Umwelt as related to any kind of reasoning.

The interpretive threshold

- In general terms **automated acts** can be said to be code-based, whereas both **wilful and habitual acts** are interpretation-based.
- An implication of this claim is that the core Umwelt is generally code-based, and that the mediated Umwelt and the conceptual Umwelt are interpretation-based.

The interpretive threshold

- If this is correct, the interpretive threshold is not located where animals *with* a nervous system meet creatures *without* a nervous system (as Marcello Barbieri has claimed), nor where the biotic meets the abiotic (as Jesper Hoffmeyer has claimed).
- Instead, *the interpretive threshold must be located where core experience meets mediated experience* (and since these aspects often intermingle, the dividing line is not in plain sight).

To what extent this claim is consistent with Marcello Barbieri's view that «neural semiosis is based on coding and interpretation» (Barbieri 2014a) is open to interpretation.

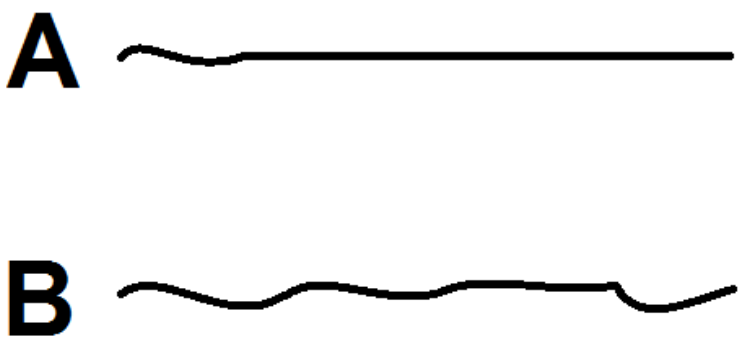
Questions for further investigation

- Can coding in automated acts of perception, and in automated mental acts, be understood within the framework of code biology (Barbieri, de Beule and Hofmeyr 2014)?
- While I have only begun reflecting on the notion of code itself, I will in the following relate codes in perception as presented here to the notions of a ***neural* codes** and of ***ecological* codes**.

Two notions of code

- $CODE_{fix}$ (fixed code): A code which after being fixed remains practically unchanged (see A)

- $CODE_{flex}$ (flexible code): A code which remains in flux (see B)



Retrospective observation 1

- When I claimed that in general terms **automated acts** (whether perceptual or mental) can be said to be code-based, and that "the **core Umwelt** is generally code-based", I had $CODE_{fix}$ (fixed code) in mind.

Neural codes: $CODE_{fix}$

- «The transformation of the signals received by the sense organs into mental images, or high-level neural states, is based on sets of rules that are often referred to as **neural codes**, because neurobiology has made it abundantly clear that there are no necessary connections between sensory inputs and mental, or neural, images.»

- Barbieri 2014b

- «[M]any animals (for example fishes) do have virtually hardwired reactions, and in those cases animal behavior is indeed largely accounted for by neural codes only.»

- (ibid)

Neural codes: $CODE_{fix}$

- «Although the neural code is far from cracked, we are able to catch, and to speak, a few syllables now, and that was not true just 10 years ago. One important reason that we can already use this idiom is its inherent adaptability, which in turn stems from the network properties of communication through neural ensembles. Even if a few words are dropped, the message still comes across, much the way a robust technological network can rapidly compensate for the loss of a few nodes.»

- Nicolelis and Ribeiro 2006: 77

Retrospective observation 2

- In general terms **automated acts** can be said to be code-based, *or more specifically based on neural codes.*

- I thus theorise that there are two kinds of automated (i.e. code-based in the sense of $CODE_{fix}$) acts which are in sum constitutive of the core Umwelt:
  - Automated acts of perception
  - Automated mental acts (applicable to conscious animals)

Ecological codes

- «[E]cological codes can be defined as mechanisms that establish an arbitrary set of connections between two or more components (organisms and/or their aggregations) of a complex system.»
- Farina 2014

- «More functions require more ecological codes, which results in more possibilities for organisms to interact with their **perception** of the external environment or **Umwelt**, sensu von Uexküll».
- (ibid)

Ecological codes

- An «ecological code [...] can be defined as the sets of (sign) relations (regular irreducible correspondences) characteristic to an entire ecosystem, including the interspecific relations in particular.»

- Kull 2010: 354

- «It is plausible to assume that codes on the ecological level are not strict regulations, but rather ambiguous and fuzzy linkages based on analogies and correspondences.».

- Maran 2012: 149

Ecological codes: $\mathbf{CODE_{flex}}$

- «Ecological codes are distributed and open. [...] *no single individual or species has full perception of an ecological code.* Instead, an ecological code forms as the sum of memories and experiences of corresponding perceptions. Every single species and organism involved in an ecological code has a partial variation of the convention." »

- Maran 2012: 150

Umwelt codes

Type of codes	Corresponding aspects of Umwelt	Involved codes
$CODE_{fix}$	Core Umwelt	Neural codes + non-neural codes?
$CODE_{flex}$	Mediated Umwelt Conceptual Umwelt	Ecological codes (including cultural codes)

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Invitations

- ***Biosemiotics:***

Submissions are welcome!

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- Surveys carried out in preparation of review articles
  - Questionnaire sent to mbs. of editorial board + board mbs. of ISBS and ISCB, posted in Academia.edu + linked to from http://biosemiosis.blogspot.com
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