A perspectivist approach to knowledge asymmetries

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"Perspective is one of the component parts of reality. Far from being a disturbance of its fabric, it is its organizing element. ... Every life is a point of view directed upon the universe. Strictly speaking, what one sees, no other can. ... Reality happens to be, like a landscape, possessed of an infinite number of perspectives, all equally veracious and authentic. The sole false perspective is that which claims to be the only one there is."
José Ortega y Gasset, 1961 [1923], The theme of our time

Question on the notion of knowledge asymmetries

Where do knowledge asymmetries come from?

- Knowledge and knowledge asymmetries are founded in cognition and learning
- I focus on the particular and important form of cognition and learning called science
  (in the broad continental sense)
Context

- Complex problems
- Societal interests
- Food
- Environment
- Agriculture
- Sustainable development
- Organics
- Climate change

Focus

- Scientific perspectives and disciplines
- Communication across scientific perspectives
- Communication with the general public
- Communication across professions, trades, domains
- General communicative discourses
A map of the presentation

A perspectivist approach - what does that mean?

A scientific discipline, e.g., is a certain perspective on the world with a certain observational field.

Scientific knowledge is based on and framed in perspectives.

To encompass knowledge asymmetries we need to encompass the knowledge generating perspectives.

A semiotic and cognitive understanding of scientific perspectives.

Examples: Nature quality Sustainability.

Different forms of knowledge asymmetries make communication across perspectives difficult.

Tools: Analysing the role of values, Different kinds of science Structures of complementarity Knowledge in a perspectivist view Polyocular communication.

A scientific discipline is a differentiated and refined perspective on an observational field.

Scientific perspective

Concepts and logic
Theories and models
Examples
Instruments
Questions and problems

Observational field

Focus
Delimitation
Aspects
Phenomena
How does science represent?
Charles S. Peirce’s semiotics: the triadic sign

What do we mean by “cow”?

What do we mean by “cow”?

Are we observing the same thing?

Two conditions for cognition

1. What we see depends on how we see it – and the same thing may therefore be seen in different ways.
   - Any cognition is necessarily a reduction since it is based on a specific context.
   - Any dynamical object has a surplus of possibilities for cognition – there is no complete cognition.

2. We cannot be sure that we see the same thing – even though we say we do.
   - A name or a description creates different interpretations or understandings of different immediate objects for different people – or for different perspectives.
   - Immediate objects do refer to dynamical ‘objects in themselves’, and dynamical objects ‘strike back’ in our interaction with them.
   - But none of the immediate objects as they are represented in the various perspectives is the same as the dynamical object in itself.

(Alrøe and Noe 2008)
A cognitive model of a scientific perspective

System delimitation
Observation presupposes a separation of the observer from the observed.

Semiotic representation
The cognitive complexity of the observer determines the complexity of the observed world.

Causal interaction
Observation presupposes an interaction between the observer and the observed.

Dynamic object

The differentiation and specialisation of science creates strong monoocular knowledge - and new communication problems

(Modified from Alrøe 2000)
Incompatible perspectives: Example 1
Nature quality

How to do research in nature quality?

What is good nature?

Does organic agriculture have a special conception of nature?

How do ‘natural-history-biologists’ and ‘ecology-biologists’ understand nature quality?

(Knowledge synthesis, 2001)

Crossdisciplinary research on nature quality

1: Knowledge synthesis that clarified different perceptions of nature quality

2: Research project with four scientific perspectives:
   • Natural history biological perspective (WP 3)
   • ecological soil biology perspective (WP 4)
   • geographical land use perspective (WP 2)
   • sociological nature experience perspective (WP 5)

How to handle the (very) different perspectives in the project?

- Cross-cuttings between different WP/perspectives based on shared study areas and shared data – but still problematic communication
  (http://orgprints.org/3921)
- Scientific article with a multiperspectival analysis of considerations and interests from three different perspectives on nature: Culturalist, Naturalist and Ecologist – interesting but difficult to carry out …
  (Tybirk, Alrøe and Frederiksen 2004)
Incompatible perspectives: Example 2
Globalisation and sustainable development

1. Growth without borders
Globalisation is not a problem, on the contrary: globalization provides new opportunities for the market.

2. Growth within limits
The economic system is dependent on a fragile ecological system with limits to growth.

3. Growth and ecological injustice
Development and efficiency are not solutions, but causes of social and ecological problems due to commercialisation of hitherto commons.

(Byrne, Glover and Alroe 2006, p. 54)
How can organic agriculture meet the challenges of globalization and sustainable development? Multiperspectival conclusions

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<tr>
<td>Focus</td>
<td>Market solutions</td>
<td>Ecological system limits</td>
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<tr>
<td>Relevant discipline</td>
<td>Neo-classical and ecological economics</td>
<td>Ecological economics</td>
</tr>
<tr>
<td>Characteristic concepts</td>
<td>Free trade, internalizing external costs</td>
<td>Sustainable scale, finite ecosphere, functional integrity</td>
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<td>How may certified organic agriculture meet the challenges of globalization?</td>
<td>Develop globally recognized principles and regionally adapted standards; create a space for organic agriculture in free trade institutions, e.g. the ‘green box’ in WTO</td>
<td>Enforce principles of ecology and sustainability in the organic certification standards to resist ill effects of market pressures</td>
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<td>How can certified organic agriculture offer a solution?</td>
<td>Provide alternative products in the market and increase consumer choices</td>
<td>Provide means to promote sustainability in non-localized food systems with global trade</td>
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<td>How can non-certified organic agriculture offer a solution?</td>
<td>Through institutional protection of vital local primary production systems and markets</td>
<td>Provide a more sustainable strategy to development of local agriculture in low-income countries</td>
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(Halberg, Alrøe and Kristensen 2006, p. 346)

Other examples of conflicting perspectives from my context

Another within sustainability: Functional integrity vs. resource sufficiency

Perceptions of animal welfare: Natural behaviour vs. clinical health. Individual vs. production system focus

Perceptions of soil quality: Specific soil attributes vs. soil qualities in relation to productivity, environment and human health

Understanding organics: What is organics and what makes it move: market vs. meaningful alternative vs. protest

Multifunctional agriculture: Functional differentiation as a prerequisite and a barrier for multifunctionality. Economics as a hegemonic perspective.
Crossdisciplinary research on multifunctional agriculture

General problems in crossdisciplinary research
(and in the use of science in democratic debate and public decision making)

- There is a fundamental and increasing heterogeneity of scientific perspectives due to functional differentiation
- The perspectives are often valuable in themselves and not reducible to other perspectives
- Fundamental concepts are understood differently in different perspectives
- Logics, problems and agendas are contested in crossdisciplinary work
- Hegemony: often a dominating perspective transforms research communication and results into its own image

We lack tools to handle this heterogeneity of scientific perspectives and the problems connected with it! And this applies as well to knowledge asymmetries.
I.
Analyzing the role of values in science, and in knowledge asymmetries

- Decide on values to be employed in ...
  - identification of problems
  - design of methods and experiments
  - model assumptions
  - use of value-laden concepts (such as sustainability and nature quality)

Reveal the values embedded in ...

Values are deeply embedded in research practice
II  Distinguishing ‘bad science’ from ‘different science’ through common criteria for good science

Relevance
Value inquiry
Participation
Transparency

Reflexive objectivity
Communicating the cognitive context
- observational
- intentional
- societal

(Alrøe and Kristensen 2002)

III  Different kinds of science: the two dimensions of reduction and detachment

General laws

More reduced research worlds

Less reduced research worlds

Classificatory sciences
Experimental sciences

Historical and descriptive sciences
Developmental science and research

Descriptions of the world

Detached stance  Involved stance

Actions and change

(Alrøe and Kristensen 2002)
### III Different kinds of science: two kinds of cognitive interest, empirical and normative

![Diagram showing the relationships between different kinds of science]

(Arne and Kristensen 2002)

### IV The structure of complementarities

A different tool to understand knowledge asymmetries is to analyse the ways in which scientific perspectives are mutually incompatible – in other words, where they are complementary.

This follows Niels Bohrs own idea that the principle of complementarity is a general principle and not restricted to quantum physics.

So far as the structure of complementarities can be mapped, this can be used to identify fundamental knowledge asymmetries.
IV

Observational complementarity (phenomenological/topological)
- Physical level: Position – momentum (Bohr), Simultaneity – relative motion
- Semiotic level: Specificity – generality
- Self-reflexive level: Justice – mercy (Bohr), Cultures (Bohr)

Dynamic complementarity (potential – actual)
- Phenomenological level: Floor plan – front elevation
- Topological level: Wave – particle
- Systemic level: Probability – outcome

Systemic complementarity (part – whole)
- Matter, Anatomy: Sign – interpretation
- Life, Behaviour: Autonomy – meaningfulness
- Life, Behaviour: Feature – person

V

Types of knowledge, disagreements and learning – based on a perspectivist view of science

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<th>Type of knowledge and expertise</th>
<th>Type of disagreement</th>
<th>Type of system learning process</th>
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<td>4. In a second order perspective</td>
<td>Contextualised knowledge. Reflexive expertise.</td>
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(Alrne and Noe 2010)
Disciplinary specialised perspectives offer a consistent, effective and precise knowledge in context of a sharply delimited research world.

Polyocular communication can unfold a multidimensional space of understanding based on second order observations of specialised perspectives. (Including observation and communication of the cognitive context)

Polyocular communication can only happen with reference to a shared dynamic object that, it is agreed, can be observed in different ways.

(Noe, Alrøe and Langvad 2008)
Some conclusions

The differentiation of scientific perspectives play a decisive role in creating knowledge asymmetries.

We need to find ways and tools to represent and handle these perspectively based knowledge asymmetries

• in crossdisciplinary science
• and in the use of scientific knowledge in education, business development, democratic debate and political decisions

In particular, second order observation and polyocular communication seems to be a promising way to handle communicational problems across perspectives

References