Contextual Meaning and Theory Dependence

Erich Rast

Nova Institute of Philosophy, Universidade Nova de Lisboa

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Overview

Theory Dependence

Every theory either directly defines the meanings of words mentioned in it or indirectly characterizes the meanings of words used to formulate it by law-like statements in which those words are used or mentioned. Therefore, a definitional account of the meaning of a word central to a theory is directly or indirectly restricted by that theory.

Problems (incomplete list)

- Problem of Topic Equality: How can two theories be about the same topic if notions central to this topic are defined or characterized differently in those theories?
- Disagreement Problem: If John defines or characterizes a word t differently from Mary, because they defend different t-theories (opinions, world views), then why are they not talking at cross purposes?
- Diachronic Meaning Problem: If theories characterize or define the meaning of a public language word, have people in the past then not talked about something else? Doesn't this make the wrong predictions, e.g. that they said something true when in fact it was false?
- Problem of Analyticity: A definitional account of lexical meaning seems to allow for statements to be true only by virtue of the meaning of a term, but Quine has argued convincingly against this notion of analyticity.
- Problem of Mutual Understanding: How can speakers understand each other if they endorse many different theories? Even subtle differences in their beliefs would lead to different characterizations of the meanings of words, leading to all kinds of misunderstandings.

What About Analyticity?

- The theory dependence thesis seems to presume a 'definitional account' of lexical meaning.
- Quine argues for various things: (i) against the alleged epistemic priority of analytically true statements or analytic judgments (Quine 1951), (ii) for ontological relativity in a pragmatist naturalistic setting (Quine 1969), cf. Decock (2002), and (iii) for theory confirmation holism (Quine 1948 1951; 1960).
- (ii) and (iii) are compatible with the theory dependence thesis, in fact, the thesis is very similar to Quine's views. Only (i) can be a problem.
- It is not a problem, as long as it is acknowledged that the adequacy of an allegedly analytic statement hinges on the merits of the underlying world-level theory. There is no epistemic priority of the statement in isolation.

There is a difference, though. The present view is not compatible with Quine's dictum that "[t]he unit of empirical significance is the whole of science." (Quine 1951: 39).

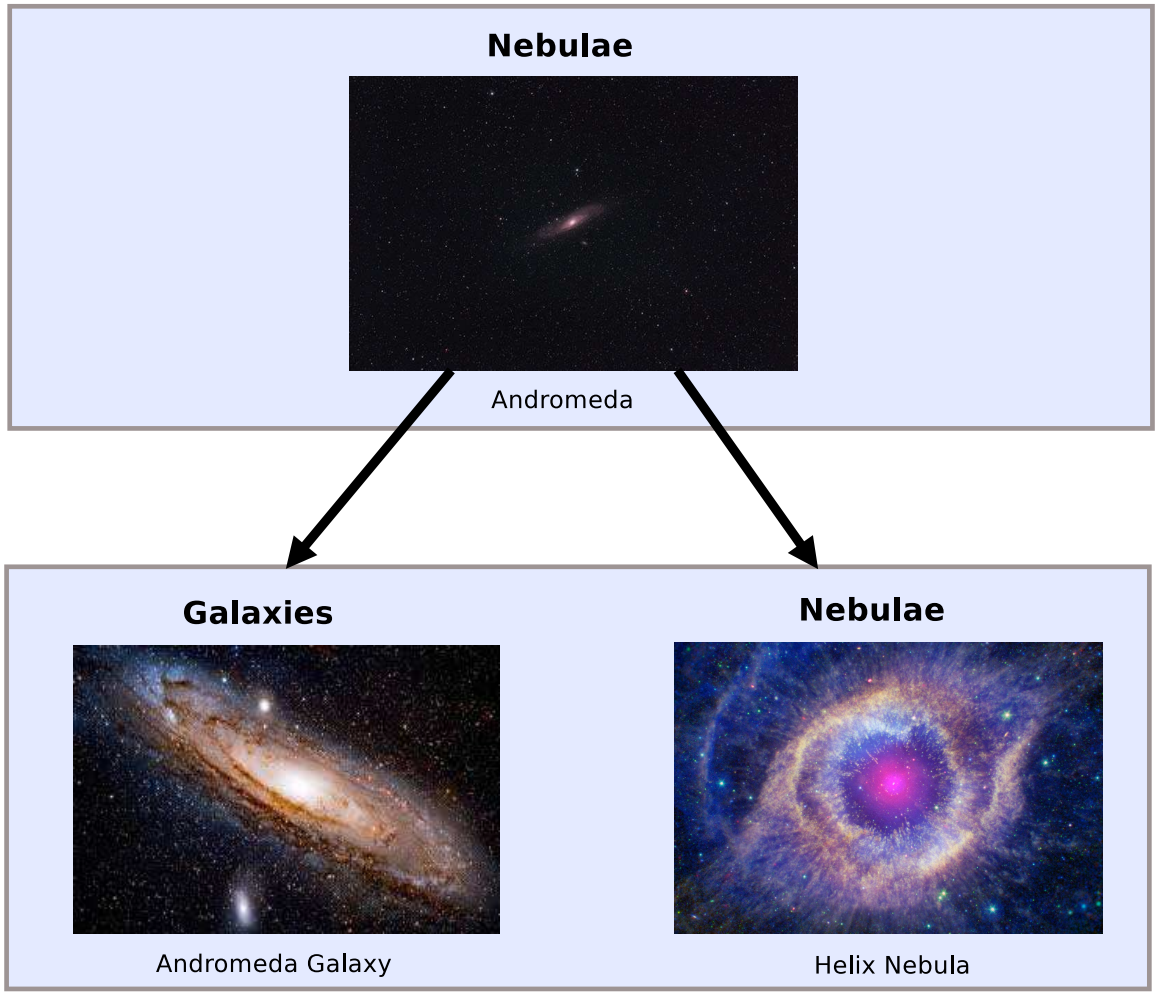
Topic Equality

Topic equality is based on several factors:

1. **Measurement Operations**: Measurement operations associated with terms that play a central role in a theory yield roughly the same extensions, or different extensions that are clearly related to each other by the measurements. See Rast (2020). Cf. Cappelen (2018) who mainly considers rough equality of extensions.
2. **Nominal Topic Equality**: The same term is stipulated to stand for the same entity, except where ambiguities are marked or explicitly introduced.
3. **Minimal Core Meaning**: Truth-functionally incomplete minimal core meaning is shared across speakers. See Rast (2017ab) and also most work in lexical semantics.

Only measurement operations with rough equality of extensions can warrant topic equality, the other notions stipulate it. Taken together, they suffice for explaining topic equality where it obtains.

Nebula vs. Galaxy Example



Theory A

falsified

Theory B

confirmed

Images courtesy of NASA, G. Moromisato,and T. Jones.

Meaning Change of *nebula*

- Does *nebula* in Theory A mean the same as *nebula* in Theory B?
- Both answers can be defended.
- I believe it is reasonable to claim that the meaning has shifted due to new discoveries.
- We now estimate there to be approx. 2 trillion galaxies in the observable universe. The number of stars in each galaxy range from 10^8 to 10^{14} (one hundred trillion).
- From the NASA science exploration page: *A nebula is a giant cloud of dust and gas in space.*

Side note: Extrasolar planets were unconfirmed until 1992. The confirmed number is now more than 4000. The estimated number of extrasolar planets in the Milky Way is 40 billion, the estimated numbers of planets in the observable universe range from trillions 10^{12} to sextillions 10^{21}.

Luminiferous Aether Example

- During 19th Century numerous theories are proposed for the medium through which light waves move. Fresnel (1818), Stokes (1845), Lorentz (1885, 1904).
- Based on Lorentz' findings and the Michelson–Morley experiment, Einstein's Theory of Special Relativity (1905) disbands with the need for aether. Instead, time and space are no longer considered constant.
- Important for us: Different explanations of aether were proposed.
- *Aether* does not seem to mean the same in those theories.

Holy Trinity Example

Arius during the First Council of Nicaea

- Arianism is the Christian belief that Jesus (God the Son) is not co-eternal with God the Father.
- A follower of Arianism cannot believe in the trinity, that God the Father, God the Son, and the Holy Spirit are of the same essence.
- Arian doctrine affects the possible meanings of *Jesus* and *God*.
- Violent clashes occurred between Arians and Trinitarians during 4th Century AD.
- Trinitarians 'won' and Arianism was branded as heretic (Council of Constantinople).

The Easy Way out

- Reject definitional accounts of lexical meaning.
- Defend **semantic atomism**: The meaning of linguistic expressions does not depend on the meanings of other expressions.
- Dummett: Semantic holism would make compositional semantics impossible, would have too many absurd consequences. Atomism has to be assumed as a methodological postulate.
- Fodor & Lepore (1992): Common arguments for semantic holism are not conclusive.
- There are different ways of spelling out semantic atomism, for example:
  - Expressions are mere syntactic tokens in a mechanical theory of cognition (Fodor).
  - Indexical externalism for all kinds of general terms: meaning $\sim$ extension.

More on Semantic Atomism

- Hard to combine with **definitional meaning**: We cannot specify the meaning of a general term by definition.
- No **semantic decomposition**: The meaning of an expression cannot be provided as a logical combination of the meanings of other expressions.
- As Lepore & Fodor (1992) argue, semantic atomism can be defended against Quine (1951) by distinguishing **theory confirmation holism** from **semantic holism**.
- Otherwise, semantic atomism fares well with Quine's critique on analyticity: It remains compatible with the claim that no statement is true solely in virtue of its meaning.
- It also solves the disagreement problem and the problem of mutual understanding.

Against Semantic Atomism

Semantic atomism may be a reasonable position about **public language meaning**. But there are many phenomena concerning **idiolects** and **concept systems** it cannot easily explain:

- Differences in **intension**: being with a liver vs. being with a heart, featherless bipeds vs. humans, round squares. Solutions require modal logic trickery that masks the problem that no reasonable of account lexical meaning is given in the first place and introduce a host of other problems such as insufficiently specified notions of 'necessity' and 'possibility'.
- Different **definitions** of the meaning expressions: *aether*, *light*, *nebula*, *atom*, ...
- **Explicit ml disputes**: *This definition of 'democracy' is inadequate.*
- Implicit ml disputes, **normative ml disputes**, ml negotiation (Plunkett & Sundell 2013): *Secretariat is an athlete.*

Against Semantic Atomism (continued)

- Productive **word composition**: Ger. *Betäubungsmittelverschreibungsgesetz*
- Obvious cases of **theory dependence**, e.g. expert agreement that expressions mean different things in different theories: *institution* according to Searle (1995) vs. Guala (2016).
- **Meaning change**: *gender*, *family*, *race*, Ger. *Weib* ...
- 'Microlanguages' (Ludlow 2014) and **fluid meaning adaptation** and accommodation in conversations.
- Linguistic misunderstandings based on **talking at cross purposes** due to assuming different meanings.
- We use **definitions** all the time, and the distinction between definitions and world-level characterization is not as clear-cut as it may seem.

Local Semantic Holism

- According to **local semantic holism**, the meaning of linguistic expressions depends on the meanings of some linguistic expressions within a theory (set of beliefs, opinions, aspects of world views).
- In terms of meaning change in an idiolect: If the meaning of one expression α changes in an idiolect, the meanings of some other expressions may change that are related to α by law-like statements.
- In terms of concept change: If one concept is modified or revised, then nomologically related concepts may change, too, but not necessarily all concepts.
- In contrast to this, according to **global semantic holism** a meaning change of one expression will affect the meanings of all other expressions in one way or another (and analogously for idiolects and concept systems).

Terminological Clarification

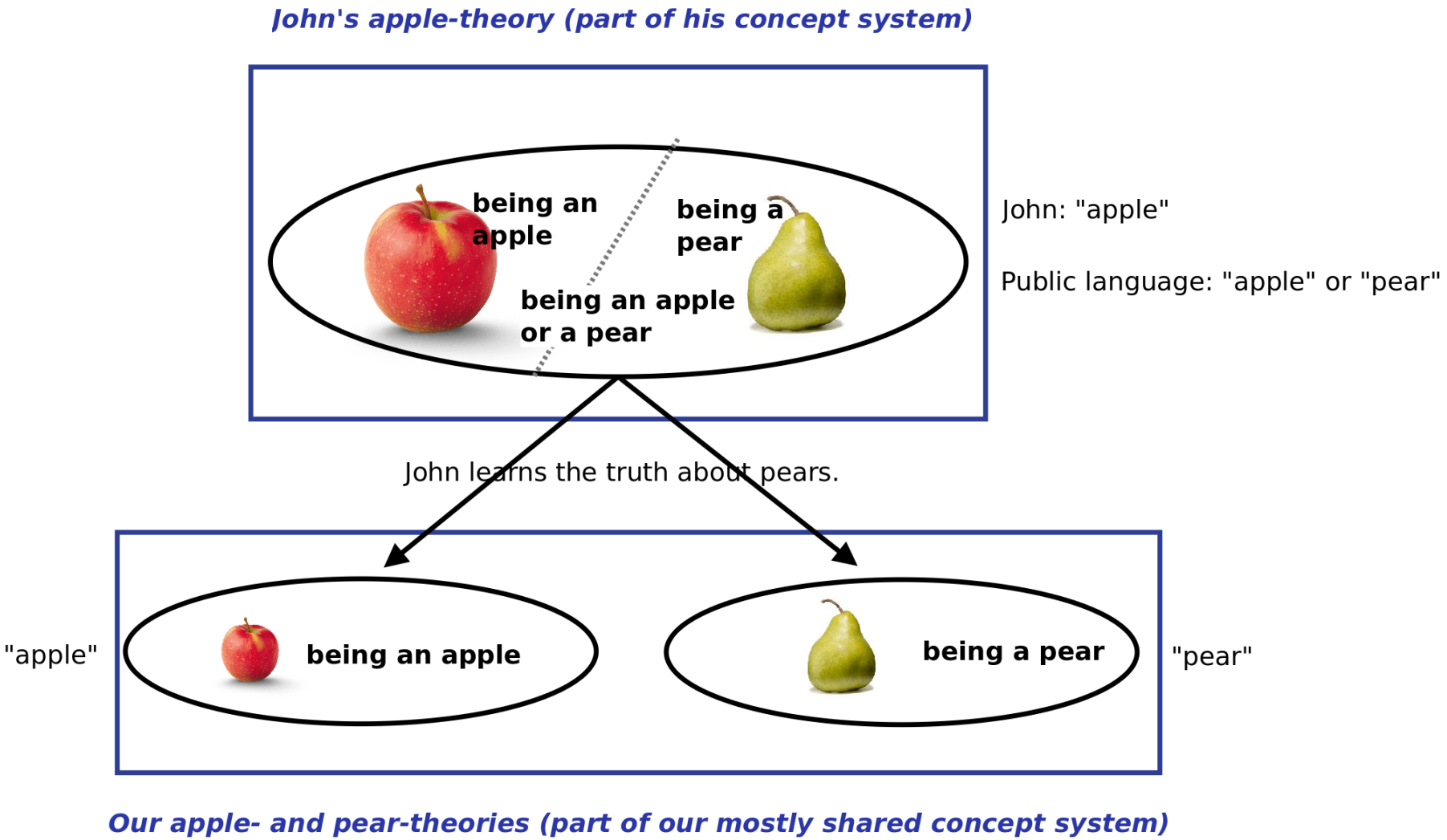
- Public language: Structural description of a language at a time insofar as it is (mostly) shared in a community of competent speakers.
- Idiolect: Partly public language, partly what an individual speaker believes certain words mean. The speaker might not be competent w.r.t. certain expressions. Idiolects can be described by attributing de re beliefs about the meanings of expressions.
- Concept system: System of meaning-like mental representations and abilities which may or may not be associated with public language words. For instance, a sculptor can use and apply the concept for a certain shape in his work (retention, recognition, etc.) without naming it or giving it his own name. Concepts systems can be described by attribution of de re beliefs, excluding linguistic beliefs.
- Ontology: An abstract description of the law-like statements that make up a concept system and relates concepts between each other.
- Theory: Part of an ontology.

Why Would Local Semantic Holism Hold?

John's Apples

John erroneously believes that pears were fruits similar to peaches but have long gone extinct. For some reason, he has learned the word *apple* and uses it in such a way that it refers to apples and pears. He later learns what pears really are and how to distinguish them from apples.

John's Learning Process



Not Everything Changes

What has changed: John's concept APPLE-OR-PEAR is refined to APPLE and PEAR. John's idiolect changes for *pear* and *apple*, the complex concept corresponding to his erroneous use of *pear* is removed from his ontology / substituted by the new PEAR concept. Various other beliefs and concepts change: apple cake, apple tart, apple juice, etc. His beliefs about fruits have changed.

What hasn't changed: John's beliefs about relations, logical connectives, quantifiers, physical vs. mental objects, numbers, movement, the nature of macrophysical objects, colors, etc., have not changed. John's beliefs about tires, atoms, galaxies, oceans, lakes, Relativity Theory, democracy, steaks, etc., have not changed either.

Ontologies are divided vertically by specificity and horizontally into theories. Centrality pertains to both specificity in the ontology and being characterized by law-like statements within theories with given topics. For example, *pear* is close to *apple* but not close to *tire* and *relation*.

Belief Compartmentalization

Physical Theories and Upper Ontologies

The Theory of General Relativity and Quantum Mechanics have substantially changed our views about time and space, and the nature of macrophysical objects. However, this does not mean that physicists have completely revised their common-sense *upper ontologies*. Instead, they are able to compartmentalize the changes to the upper ontology needed in an area 'theoretical physics', and maybe even compartmentalize theories within physics from each other. Note: Quantum Mechanics and General Relativity do not seem to be fully compatible with each other.

We are able to track theories and compartmentalize them without endorsing them or revising our common-sense ontologies by them. We can also to some extent simultaneously endorse theories that are strictly speaking incompatible with each other (e.g. Newtonian, Relativistic, and Quantum Mechanics).

We Sometimes *Have* to Compartmentalize Beliefs

- There are many cases of learning things from testimony or direct evidence that do not yet warrant revision of existing theories.
- We need to keep track of alternative hypotheses, competing theories, and possibly conflicting evidence.
- Multiple sources of evidence may together exceed the threshold for endorsing a theory, even though each source on its own remains below it.
- We need to keep track what others believe (to some extent), even if it contradicts some of our beliefs, in order to understand and make sense of them. Obviously, this does not imply that we have to endorse what they believe.

It is rational and required for epistemological reasons to have compartmentalized beliefs and keep track of mutually incompatible theories and information sources.

Towards Mutual Understanding

- It is not far-fetched to assume that understanding of what others say *is* always limited and relative to the background beliefs of the interlocutors, including their linguistic beliefs.
- Is there constant misunderstanding?
- Not from the perspective of local holism + belief compartmentalization: We keep track of what others believe and the theories (opinions, world views) they advocate.
- We can assume that major parts of our common-sense ontologies coincide (especially the upper ontology).
- Keeping track of a theory also involves keeping track of definitions and indirect characterizations of expressions used or mentioned by that theory.
- Two speakers can disagree on the basis of possibly incompatible theories without endorsing them.

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