New York University
Seminar *Truthmaker Semantics*
November 17, 2022

Semantic Notions Reflected in Natural Language: Truthmaking

Friederike Moltmann
CNRS – Université Côte d'Azur

1. The issue

Are notions or entities used in the semantic theory reflected explicitly in the object language , in particular truthmaking and situations (states) as truthmakers?

1.1. Semantic notions

Standard aims of (formal) semantic theories
Truth conditions and inferential relations, semantic acceptability, compositionality, cognitive adequacy (sometimes)

Semantic notions used in semantic theories
Meaning / denotation and reference
Truth or truthmaking

1.2. Semantic domains of entities

Involvements of entities:
Why positing entities?
Making sense of reference and predication, quantification, modifiers, compositionality

Can natural language provide (additional) support for conceiving of notions or entities in the semantic theory in a particular way?

[1] Should semantic notions or entities involved in natural language also be used in the metalanguage in 'the same way'?
[2] Are semantic notions or entities used in the metalanguage explicitly reflected in predicates, categories or constructions in natural language?

Important limitation

Not all expressions can give such independent support, e.g. not technical expressions, such as *denote, make true, possible world.*
Other kinds of expressions that are irrelevant even if they are part of natural language: sortals (*world, time, situation, event,* etc).

The core-periphery distinction

Natural language to an extent involves an implicit ontology and an implicit philosophy of language, but only as reflected in the *core of language*, not its periphery.

Periphery

Expressions (whether central or not central in language use) that are technical terms or used in a technical, non-ordinary, 'philosophical' way:
expressions whose application requires some amount of (naïve or not naïve) philosophical reflection.

Expressions homophonous with expressions from the metalanguage that are not (entirely) in the periphery can give important insights into the notion in the metalanguage.

---

2. Roles of entities semantic theories

[1] Reference, quantification
[2] Implicit arguments
[3] Parameters of evaluation
[4] Truthmakers
[5] Perhaps: higher-order beings for non-referential complements, non-nominal quantification

Reference and quantification

Individuals as referents of identifying terms (e.g. *the man in the garden*)
Propositions, facts, possibilities as referents of individuating terms (e.g. *the fact that it is raining or snowing*)

Concerning implicit arguments:
Events as implicit arguments of verbs
Particularized properties (tropes) as implicit arguments of adjectives – or states, or degrees
Observation: Implicit arguments make a better case for what is implicit involved in the ontology of natural language than explicit reference and quantification

Concerning parameters of evaluation (worlds, times)
One view:
Modal and temporal operator do not involve worlds and times as individuals in the domain of the language, no ontological commitment to worlds and times
Alternative view:
Modal and temporally operators are ontologically committing (Crewsswell (1990)
General observation (Partee, Schlenker): There are referential and bound variable uses of tense and modals, e..g. with *would* (*I would accept the invitation*) and bound variable uses (*If John came, Mary would come too*)

---

3. Examples of support from natural language for particular semantic notions

3.1. Plural reference

Semantics of definite plurals not treated within first-order logic and mereology, but rather in terms of plural reference, reference to several individuals at once
Reference to pluralities as many also in the metalanguage (Yi 2005, 2006 and others)

(1) a. The students gathered.
b. [*the students*] refers to each student at once.
c. *The students gathered* is true iff *gathered* holds of each student at once.

3.2. Higher-order quantification

Dealing with absolute generality Williamson (2003)

Accounting for apparent higher-order quantifiers in natural language (Prior 1971)

(2) a. John remained happy.

b. John remained something.

Higher-order semantic values also in the metalanguage, which is not that of set theory.

3.3. Reference

Reference in natural language as an intensional relation (d'Ambrosio 2019):

(3) John referred to a ghost.

D'Ambrosio's onclusion

Reference relation conveyed by *refer* is compatible with externalist and internalist semantics.

3.4. Meaning

Mean in English takes direct quotes as complements:

(4) a. 'Rouge' means 'red'

b. ??? 'Red' means the property of being red / the concept red / some entity.

Possible conclusions

Meanings are not as objects; 'meaning' is not a relation

Meanings are constituted by the use of a concept or are the the products of language use

---

4. Truthmaking and situations in their truthmaking role

4.1. Two questions to be distinguished

[1] Do the same entities that act as truthmakers occur in other semantic roles?

Plausible cases:

- Events as implicit arguments of verbs
- Situations as arguments of verbs of direct perception (*Joe saw Mary leave*)
- *When*-clauses binding event variables (*When John catches a fish he is happy*)
- Adverbs of quantification (*Sometimes a teacher inspires a student*)

[2] Are there constructions or expressions that introduce situations in other semantic roles, referents of referential NPs, via truthmaking?

Plausible cases:

- NPs with the noun *case* as head noun
- NPs with 'event' or 'situation' as head noun in Russian

[3] Are there expressions that convey truthmaking in natural language?

Plausible cases:

- *Is the case* and verbs of occurrence*: occur, happen*
- *Be* in English and German in certain environments

4.2. *Case*-constructions (Moltmann 2021)

Nominal *case*-constructions

(5) a. several cases in which a student passed the exam

b. the three cases in which a student passed the exam

(6) a. the cases in which Mary has received an invitation or John has received one

b. the two cases in which it rains or it snows

(7) a. the two cases in which Mary received an invitation or John received one

b. ??? the three cases in which Mary received an invitation or John received one

(8) a. We discussed the case in which John does not show up.

b. The case in which no one is satisfied is not a good prospect.

Reference to kinds of cases

(9) a. the case in which a student passes the exam

b. the case in which it is rainy on a Sunday

(10) a. The case in which someone passes the exam has never occurred before.

b. I have never encountered the case in which a candidate was unable to speak during the oral exam

Pluralities of kinds of cases

(11) a. the two cases in which someone arrives late or someone cannot come

b. the case in which someone arrives late or someone cannot come

(12) a. k([someone arrives late]), k([someone cannot come])

b. k([someone arrives late or someone cannot come]

(13) The semantics of case-nominals describing particular cases

For a context c, [*case in which* S]^c ={s | s ∈ [case] ^{c} & s ∈ [S]^c }

(14) a. The semantics of case-nominals describing kinds of cases

For a context c, [case$_{kind}$ in which S$_k$] c ={k | k ∈ [*case*$_{kind}$] c & k ∈ [S$_k$]^c }

b. For a context c and kind k of situations, k ∈ [case$_{kind}$]^c iff for all s, if s I k, then s ∈ [*case*] c

In which –clauses vs *that*-clauses:

German use of *that*-clauses

(15) a. der Fall, dass jemand zu spaet kommt

'the case that someone is late'

b. ein Fall, in dem jemand zu spaet kommt

'a case in which someone is late.

The Case Space Requirement

Sentential case spaces

No case reference to single known facts in the past or present or single time-less facts:

(16) a. ??? We discussed the case in which John returned yesterday.

b. ??? The case in which John has solved the problem was unexpected.

c. ??? The case in which it is raining outside bothers us.

d. ??? The case in which 3 is a prime number is well known.

Contrast with fact descriptions:

(17) a. We discussed the fact that John returned yesterday.

b. The fact that John has solved the problem was unexpected.

c. The fact that it is raining outside bothers us.

d. The fact that 3 is a prime number is well known

Epistemic case space

(18) a. We cannot exclude the case in which John might have returned yesterday.

b. We cannot exclude the case in which John returned yesterday.

c. ??? The case in which John returned yesterday surprised us.

(19) Case spaces

a. For a sentence S, CS(S) = {s |s ⊩ S & ∃s´(s´ ⊩ S & s ≠ s´)}. (sentential case space)

b. For an epistemic state d, CS(d) ={s | s ⊩ d & ∃ s´(s´ ⊩ d & s≠ s´)} (espistemic case space)

(20) Lexical condition on the noun *case*

For a context c, a situation s and a set X, if\s, X ∈ [case] c , then for an epistemic state or sentence d, X = CS(d) and s ∈ X.

Case anaphora

(21) a. ?? John is happy that he won the election. In that case, he wants to celebrate.

b. ?? John noticed that Mary is at home. In that case, Bill is at home too.

(22) a. John knows that he will win or lose. In either case, he will continue training.

b. John hopes/fears that Mary is at home. In that case, he believes that Bill is at home too.

Conclusion

Case-NPs make reference to situations as truthmakers within a sentential or epistemic case space.

4.3. The predicate *is the case* and verbs of occurrence

4.3.1. English and German data

Is the case

(23) That John is nervous is often the case.

The Case Space Condition:

(24) ??? That John is nervous is the case..

Verbs of occurrence

(25) a. That a student in this school failed an exam has never *occurred*.

b. It has sometimes *happened* that John was late.

Occur accepts only *that*-causes with eventive verbs:

(26) a. In John's family, it is not the case that children respect their parents.

b. ?? In John's family, it does not occur that children respect their parents.

Is so in English:

As a predicate of occurrence only with sentential anaphora or epistemic modals:

(27) a. ??? That it is cold in winter is simply so.

b. Is that so?

Epistemic modals:

(29) a. Could it be that the problems has been solved?

b. It can't be that the problem has been solved.

But not in German:

(28) a. Daβ es im Winter kalt ist, ist einfach so.

'That it is cold in winter is simply so.

b. Daβ es im Winter kalt ist, war schon immer so.

'That it is cold in winter was always so.

Potential explanation of the difference:

Is so requires an epistemic case-space in English, but not in German.

4.3.2. Bondarenko (2021) on Russian

Nouns of propositional attitudes:

(29) Mne to. prišla v in golovu mysl' [cto ˇ COMP belki squirrels s"eli vse orexi].

'I had a thought that squirrels ate all the nuts.'

Event / situation nouns:

(30) Na on prošloj nedele byl was slucaj ˇ [cto ˇ COMP belki s"eli vse orexi].

'Last week there was an event of squirrels eating all the nuts.'

(31) Vcera ˇ proizošla /slucilas' ˇ /situacija [CP cto ˇ COMP moj zakaz zaderžali].

'Yesterday a situation that my order was delayed happened /occurred.'

Clausal complements with Russian verbs of occurrence:

byvat' 'happen', sluˇcatsja 'occur', proisxodit' 'take place'.

<u>Bondarenko's proposal: two meanings of clauses</u>

[1] Properties of content bearers:

(33) Jmysl' cto belki s"eli orexi ˇ K

λx. thought(x) ∧ Cont(x)= [the squirrels ate the nuts]

[2] Properties of events / situations (exemplifying situations in Kratzers' sense or truthmakers):

(34) Jslucaj ˇ cto belki s"eli orexi ˇ K

= λs. event(s) ∧ s ∈[the squirrels ate the nuts]

CPs with the second meaning can occur with an optional modifier *takoe* ‘such’, but not with the first meaning :

(35) Slucilos’ /proizošlo / (takoe) (such) cto ˇ COMP belki s”eli vse orexi. lit.
‘That the squirrels ate all the nuts occured /happened.’

(36) * Maša dumaet /somnevaetsja / takoe cto ˇ COMP belki squirrels s”eli vse orexi.
‘Masha thinks /doubts that the squirrels ate all the nuts.’

4.3.3. Direct perception verbs as truthmaking verbs

Candidates for perception verbs acting as truthmaker predicates:
taking as arguments events or situations that are truthmakers of the complement:

(37) a. John saw [Mary leave].
b. John heard [Mary sing].
c. John let May leave.
d. John made Mary cry

(38) ∃s(see(John, s) & s ∈ [Mary leave])

Bondarenko on Russian

Pomnit’ ‘remember’, zameˇcat’ ‘notice’, videt’ ‘see’ can combine with takoe ‘:

(39) Lena pomnit {takoe such cto} ˇ COMP /{kak} /COMP.DIRECT Mitja kuril.
‘Lena remembers M.’s smoking.’ ⇒ Lena directly perceived M. smoking.

Without modification by takoe ‘such’, there is no direct perception requirement:

(40) Lena pomnit (to) (that.DEM) cto ˇ COMP Mitja Mitya kuril, xot’ ona i CONJ ne NEG
videla ego ni razu kurjaščim. ˇ smoking ‘
‘Lena remembers the fact that Mitya smoked, despite not seeing him’

4.4. The crosslinguistic issues

Do predicates differ in their ability to convey truthmaking or do clausal complements differ in their denote properties of truthmakers?

Evidence points to the latter:

English *that*-clauses

Can denote properties of content bearers, including modal objects that are states of affairs

(41) That it is raining is likely.

English *in which*-clauses

Denote properties of situations or kinds of situations that are truthmakers of the sentence

German *dass*-clauses

Can also denote properties of kinds of situations that are truthmakers of the sentence

(42) Der Fall, dass sein Student das Examen besteht.

the case that a students passes the exam.

Russian *cto*-clauses:

Can also denote properties of situations that are truthmakers of the sentence

What to do about *that*-clauses as complements of verbs of occurrence in English and related languages:

Verbs of occurrence express truthmaking, but take kinds of trthmakers as arguments:

Davidsonian event argument as an instance of the modal object

(43) a. That S occurred.

b. ∃e(occur(e, kind([S])) iff e I kind([S]))

References

D'Ambrosio, J. (2019): 'Semantic Verbs are Intensional Transitives', *Mind,* 128 (509), 213-248.

Bondarenko, T. (2021): The dual life of embedded CPs: Evidence from Russian ˇcto-clauses'. *Proceedings of SALT* 31: 304–323, 2021

Fine, K. (2017): 'Truthmaker Semantics'. In B. Hale et al. (eds.): *A Companion to the* Philosophy of Language V, Oxford: Wiley-Blackwell, 556–577.

Moltmann, F. (2021): 'Situations, Alternatives, and the Semantics of 'Cases'. Linguistics and Philosophy 44, 153-193.

---------- (2020): 'Abstract Objects and the Core-Periphery Distinction in the Ontological and Conceptual Domain of Natural Language," in Falguera, J. L. and C. Martínez (eds.), *Abstract Objects. For and Against*. Synthese Library, Dordrecht: Springer pp. 255-276

---------- (2015): 'Truth Predicates' in Natural Language'. In D. Achourioti / H. Galinon / J. Martinez (eds): *Unifying the Philosophy of Truth*. Springer: Synthese Library,

Dordrecht, pp. 57-83.

Prior, A. N. (1971): *Objects of Thought*. *Oxford University Press*, Oxford.

Rosefeldt, T. (2008): 'That'-clauses and non-nominal quantification'. *Philosophical Studies*, 137: 301–333.

Williamson, T. (2003): 'Everything'. *Philosophical Perspectives* 17, 415–465.

Schlenker, P. (2006) 'Ontological Symmetry in Language: A Brief Manifesto'. Mind and Language 21(4). 504–539.

Oliver, A. and T. Smiley, 2013, *Plural Logic*. Oxford: Oxford University Press.

Yi, B.-Y., 2005, "The Logic and Meaning of Plurals. Part I," *Journal of Philosophical Logic* 34, 459-506.

---------- 2006, "The Logic and Meaning of Plurals. Part II," *Journal of Philosophical* Logic 35, 239-288.