

Hamburg Summer School *Truthmaker Semantics*

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Handout 2

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## The Semantics of Attitude Reports and Modal Sentences

### 1. The Semantics of simple attitude reports

The logical form of attitude reports on the standard view

- (1) a. John claims that S.  
 b.  $\text{claim}(\text{John}, [\textit{that S}])$

Davidsonian event semantics:

Events as Davidsonian implicit argument of attitude verbs:

- (2) a. John walked slowly.  
 b.  $\exists e(\text{walk}(e, \text{John}) \ \& \ \text{slowly}(e))$

Standard view of attitude reports:

- (3) a. John claims that S.  
 b.  $\exists e(\text{claim}(e, \text{John}, [\textit{that S}]))$

New view of the logical form of attitude reports

- (4) a. John claims that S.  
 b.  $\exists e(\text{claim}(e, \text{John}) \ \& \ [\textit{that S}](\text{att-obj})(e))$

Function of *that*-clause complements of attitude verbs:

act semantically predicates of the attitudinal object associated with the Davidsonian event (state) argument

- (5) a. John claims that S.  
 b. John makes the claim that S.

c.  $\exists e \exists ! d (\text{make}(e, \text{John}, d) \ \& \ \text{claim}(d) \ \& \ [\text{that } S](d))$

(6) a. John believes that S.

b. John has the belief that S.

c.  $\exists e (\text{believe}(e, \text{John}) \ \& \ [\text{that } S](\text{att-obj}(e)))$

### Philosophical motivations for the analysis

[1] Propositions are no longer treated as the objects of attitudes; rather sentential contents serve to characterize the contents of attitudinal objects

[2] Intentionality, the ability of represent, is treated as a property of *mental entities* (states, products) only, rather than of abstract meaning objects (propositions)

### Linguistic motivations for the analysis

1. The alternation between complex and simple attitudinal predicates. Sometimes only complex predicates: *have the impression that S*, German *Angst haben* ('have fear')

2. Avoid substitution problems (*claim that S*  $\rightarrow$  *claim the proposition that S*) (Moltmann 2003a, b, 2013)

3. Propositions are not treated as objects in the semantics of natural language

4. The semantics of special quantifiers and pronouns (Moltmann 2003a, b, 2013):

(7) a. John claims / knows / fears *something*.

b. John imagines / expects *that*.

c. John claims *what* Mary claims.

Understanding of quantifier restrictions:

(8) a. John said something nice (namely that S).

b. John said something that made Mary very upset.

### Restrictions on reports of shared content of different attitudes

(9) a. ?? John expects what Mary believes, namely that Sue will study harder.

b. ?? John's expectation is Mary's belief.

Special (nominalizing) quantifiers range over attitudinal objects (or kinds of them).

### The logical form of attitude reports with special quantifiers

(10) a. John said thought something nice.

b.  $\exists e \exists e' (\text{say}(e, \text{John}) \ \& \ \text{nice}(e') \ \& \ e' = \text{att-obj}(e))$

(11) a. John expects what Mary expects.

b.  $\exists e \exists e' \exists e'' (\text{expect}(e, \text{John}) \ \& \ e' = \text{att-obj-kind}(e) \ \& \ \text{think}(e'', \text{Mary}) \ \& \ e' = \text{att-object-}$

kind(e''))

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## 2. The semantics of modal sentences

### The logical form of modal sentences

(12) a. John needs to leave.

b. John has a need to leave.

c.  $\exists d(\text{need}(d) \ \& \ [\textit{John to leave}](d))$

(13) a. John is permitted to leave.

b. John has permission to leave.

c.  $\exists d(\text{is permitted}(d) \ \& \ [\textit{John to leave}](d))$

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## 3. How do clausal complements (sentential units) act semantically as predicates of attitudinal and modal objects?

### 3.1. Possible-worlds-based account

An attitudinal (or modal) object  $d$  is associated with a set of alternative worlds  $f(d)$ :

(14)  $[S] = \lambda d[\forall w(w \in f(d) \leftrightarrow S \text{ is true in } w)]$

#### The difficulty

The account cannot apply to *modal objects of possibility*

(15) a. John is obliged to leave.

b. John is allowed to leave.

Problem also arises for attitude reports, i.e. illocutionary act reports:

(16) a. John forced Mary to leave.

b. John allowed Mary to leave.

Make sentential content dependent on embedding verb? – noncompositional semantics:

(17)  $[S] = \lambda d[\exists w(w \in f(d) \ \& \ S \text{ is true in } w)]$

Difficulty for possible worlds-account as such:

inapplicable to explicit (heavy) permissions (*John gave Mary permission to leave*), as opposed to implicit (light) permissions (*it is permitted to leave*).

### 3.2. Truthmaker semantics

Exact truth-making/satisfaction  $s \Vdash S / s \Vdash d$ :

The situation or action  $s$  is an *exact truthmaker/satisfier* of the sentence  $S$  / the attitudinal or modal object  $d$

Standard truthmaking conditions for complex sentences:

(18) a.  $s \Vdash S \text{ and } S'$  iff for some  $s'$  and  $s''$ ,  $s = \text{sum}(s', s'')$  and  $s' \Vdash S$  and  $s'' \Vdash S'$ .

b.  $s \Vdash S \text{ or } S'$  iff  $s \Vdash S$  or  $s \Vdash S'$ .

Truthmaking for negations:

(19)  $s \Vdash \text{not } S$  iff  $s \not\Vdash S$ .

Bilateral propositions:

A sentence  $S$  has as its meaning a pair  $\langle \text{pos}(S), \text{neg}(S) \rangle$  consisting of a positive denotation, the set  $\text{pos}(S)$  of verifiers of  $S$ , and a negative denotation, the set  $\text{neg}(S)$  of falsifiers of  $S$ .

Partial content

(20) For sets of situations or actions  $A$  and  $B$ ,  $B$  is a *partial content* of  $A$  iff every satisfier of  $A$  contains a satisfier of  $B$  and every satisfier of  $B$  is contained in a satisfier of  $A$ .

Object-based truthmaker semantics

Difference between obligations and permissions (and modals objects of other flavors of different forces):

Obligations have both satisfiers and ‘violators’; permissions have only ‘satisfiers’

An attitudinal or modal object  $d$  has a positive denotation  $\text{pos}(d)$  and a (possibly empty) negative denotation  $\text{neg}(d)$

(21) Sentence meanings as properties of attitudinal and modal objects of either modal force

$\lambda d[\text{pos}(S) \text{ is a partial content of } \text{pos}(d) \ \& \ \forall s(s \Vdash S \rightarrow s \Vdash d) \text{ in case } \text{neg}(d) \neq \emptyset]$

Motivation for the partial content condition

Underspecification of the satisfaction conditions of desires, hopes, and needs:

- (22) a. Fiona wants to catch a fish (that she can eat). (Fara 2007)  
 b. John hopes to get a coat (that keeps him warm).  
 c. Bill needs to hire an assistant (that speaks French)

The speaker uttering (22a) need not know what the exact constraints are that Fiona's desire may impose on what satisfies it.

Significant argument for object-based truthmaker semantics, if the generalization is correct: It is the modal or attitudinal object that specifies what the exact satisfiers are, the sentence underspecifies them.

Different intuitions for truth-directed attitudes?

- (23) John believes / claims that Fiona caught a fish.
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#### **4. The logical form of more complex attitude reports**

##### **4.1. Response-stance verbs**

- (24) a. John repeated that it will rain.  
 b. John confirmed / denied that it was raining.  
 c. John agreed that Bill is lazy  
 d. John reminded Mary to return the keys.

Further evidence against the Relational Analysis of attitude reports: the semantics of partly

- (25) a. John partly ate the chicken.  
 b. ??? John partly claims that Mary is incompetent.  
 c. ??? John partly thinks that the students are talented

##### Response-stance verbs (Cattell 1978)

- (26) a. John partly confirmed / denied that the students failed the exam.  
 b. John partly agreed that Bill is unsuited for the job.

##### Formal semantics:

*Agree* as a three-place predicate taking the contextually given attitudinal object as a third argument:

(27)  $\exists e(\text{agree}(e, \text{John}, d) \ \& \ [\textit{that S}](\text{att-obj}(e)) \ \& \ [\textit{that S}](d))$

Support for (27): response stance verbs more easily allow for substitution:

(28) John agreed with the request to leave.

Partly expressing a relation between events and types of events:

Part structure of the event inherited from the part structure of the object arguments.

(29) a.  $\exists e'(\text{partly}(e', \hat{e}[\text{eat}(e, \text{John}, \text{the chicken})]))$

b.  $\exists e'(\text{partly}(e', \hat{e}[\text{agree}(e, \text{John}, d)]) \ \& \ [\textit{that S}](\text{att-obj}(e')) \ \& \ [\textit{that S}](d))$

## 4.2. Factive verbs

Factive verbs pattern with response-stance verbs in various syntactic respects (Cattell1978).

They also behave the same with respect to *partly*:

(30) a. John partly recognizes that he failed.

b. John partly recognizes the fact that S.

Clausal complements of factive verbs also have a double function

- They characterize the described cognitive product / epistemic state
- They give the content of a (non-worldly) fact

Non-worldly facts characterized by a sentence S as modal objects whose satisfiers are situations that are part of the actual world and truthmakers of S.

For *f* as a world-relative operator mapping the positive denotation of a sentence onto the corresponding factive modal object:

(31)  $\exists e(\text{realize}(e, \text{John}, f_w([S])) \ \& \ [\textit{that S}](\text{att-obj}(e)) \ \& \ [\textit{that S}](f_w(\text{pos}(S)))$

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## 5. Clausal subjects

Evidence that *true* with a *that*-clause does not apply to a proposition, but rather to an attitudinal object: the applicability of the normative truth predicate *correct* to *that*-clauses.

*Correct*, which is inapplicable to propositions, is unproblematic with *that*-clauses (in subject position and when extraposed), and then, as with beliefs and claims, it conveys truth (and just truth):

- (32) a. That John is the director is correct.  
 b. It is correct that John is the director.

*Is true* gives the content of a contextually given content-bearer (a claim, rumor, or suggestion)

- (33) a. That S is true.  
 b. true([that S](d))

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