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**Object-Based Truthmaker Semantics for Embedded Sentences**

Friederike Moltmann

CNRS and Ca’ Foscari

1. **Introduction**

Harves and Kayne (2015) and Arsenijevic (2009):

(Certain) Modal sentences and (certain) attitude reports involve clausal complements that are in fact relative clauses modifying a noun in an underlying light-verb noun construction:

(1) a. John needs to leave.

b. John have-need [to leave]

(2) a. John claims [that he is French]

b. John make-claim [DP ~~claim~~ [CPthat [FP ~~claim~~ (+assert) [F+assert] [he is French]]]]

Arsenijevic’s analysis:

Complement clauses are special relative clauses, involving a nominal version of the verb in the specifier position of the force projection of the clause whose force feature has to match the feature of the head of that projection, which explains the obligatoriness of clausal complements.

Aims of the presentation

- give a novel semantic interpretation of (1b, 2b), based on the ontology of attitudinal and modal objects and truthmaker semantics (Fine 2017)

- suggest corresponding syntactic and semantic analysis of quantifiers and pronouns that can take the position of clausal complements

- suggest extension of the analysis to wh-clauses and infinitival complements.

What are attitudinal and modal objects?

Intuitively, things we refer to as

- claims, requests, thoughts, assumptions, beliefs, judgments, desires, intentions, decisions, hopes, impressions, guesses

- obligations, needs, permissions, possibilities, abilities, options, etc

Standard view

Propositional attitudes (beliefs, hopes, desires) are relations between agents and propositions, abstract, shareable truth bearers that are also meanings of sentences

The new view

Attitudinal objects take on the role of propositions, but in somewhat different ways.

Modal objects are at the center of the semantics of modals

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**2. Problem for the standard view of the semantics of attitude reports**

The Relational Analysis of attitude reports

(3) a. John thinks that Mary is happy.

b. think(John, [*that Mary is happy*])

c. ∃e(think(e, John, [*that Mary is happy*]))

Apparent support for the Relational Analysis

1. ‘Special’ quantifiers and pronouns in sentential position:

(4) John thinks that Mary is happy.

John thinks *something.*

2. Reports of sharing:

(5) Mary believes *what* Bill believes.

Bill believes that it is raining.

Mary believes that it is raining.

Difficulties for the Relational Analysis

1. Conceptual problems for propositions

2. Propositions are treated as the objects of attitude, not the contentsof attitudinal objects.

3. We never refer to propositions explicitly in natural language, except with uses of technical terms (*proposition*).

4. Empirical problems (Moltmann 2003, 2013):

- The substitution problem and the objectivization effect

(6) a. \* John thought the proposition that S.

b. ?? John fears the proposition that S.

- Special quantifiers and pronouns do not stand for propositions, but rather for attitudinal objects or kinds of them

(7) a. John claimed *something* shocking.

b. ??? John claimed what Bill expects, that it will rain.

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**3. The ontology of attitudinal objects**

**3.1. The role of attitudinal objects**

Types of attitudinal objects

Act-related attitudinal objects:

- cognitive and illocutionary ‘products’*:* assumptions, decisions, claims, requests, promises

- ‘results’: conclusions, recognitions, persuasions

State-related attitudinal objects:

- beliefs, desires, hopes, fears, intentions

Nominalizations of attitude verbs have a single meaning:

They stand for a third category of object that are neither events nor states: attitudinal objects

Some evidence

Predicates (or predicate readings) that are inapplicable to events and propositions, e.g. predicates of satisfaction (Twardowki 1912, Ulrich 1976):

(8) a. Mary’s request / desire was fulfilled.

b. ?? Mary’s speech act / mental state / requesting was fulfilled.

c. ?? The proposition that Mary should be invited was fulfilled.

**3.2. The properties of attitudinal (and modal) objects**

- Three content-related properties

[1] Truth- and satisfaction conditions

[2] Similarity relations based on sameness of type and shared content only

[3] Part-whole structure based on partial content

- Properties of concreteness

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**4. The semantics of attitude reports with attitudinal objects**

**4.1. Semantic function of *that*-clause complements of (simple) attitude verbs**

Predicates of the attitudinal object ‘associated with’ the attitude verb, specifying its satisfaction condition or content (roughly, the set of situations or actions that make it true)

(9) [*the claim that it is raining*] = the d [claim(d) & [it is raining](d)]

Simplified truthmaker semantics (Fine 2017)

The semantic value of a sentence (IP) is a set S of situations, actions, or attitudinal objects that are exact truthmakers of the sentence (= make the sentence true and are wholly relevant for the truth of the sentence).

(10) cont(IP) = λd[∀s( s ∈ S ↔ s ­||- d) ]

**4.2. Status of attitudinal objects in regard to the attitude verb**

**4.2.1. Arguments of the attitude verb?**

- Attitudinal objects are not Davidsonian events; thus clausal complements cannot be viewed as predicates of the Davidsonian event argument:

(11) a. John claims [that S]

b. ∃e(claim(e, j) & [that S](e))

The problem: ontological distinction between events and attitudinal objects

**4.2.2. The Kratzer / Moulton view**

Clausal complements are predicates of implicit content bearer arguments of attitude verbs:

(12) claim(j, d) & [that S](d)

Analysis predicts substitution by DPs is possible

Analysis correct for certain verbs:

perhaps believe (*believe the claim that* S), *regret* (*regret* *the fact that* S), *confirm* (*confirm the suggestion that* S)

**4.2.3. The present approach**

Focus on complex attitude predicates (light verb – noun) and derive the syntactic structure of ‘simple’ attitude reports from attitude reports with complex predicates

(13) a. John claims that S.

b. John makes the claim that S.

c. ∃d(make(John, d) & claim(d) & [*that* S](d)

Modified analysis of attitude reports given by Arsenijevic

(14) John [N claim] make [DP[NP ei] [that [FP[SPEC ei] [F’ [Fv] [IP he is French]]]]

The feature variable v must match the relevant feature of *claim* or whatever noun is in specifier position of FP (‘force projection’).

v will not be a feature such as [+assert] or [+question] (‘force’ feature)

Rather it stands for a function mapping the content of the IP onto a property of objects (more on that shortly).

Interpretation of (14) based on *claim* in the lowest position:

(15) ∃e∃d(make(e, John, d) & claim(d) & [that he is French](d))

Semantics of special quantifiers/pronouns

Special quantifiers and pronouns stand for attitudinal objects or kinds of them:

(16) John claimed *something* shocking.

Restrictions on reports of a shared content of different attitudes

(17) a. ?? John expects *what* Mary claims, namely that Sue will study harder.

b. ?? John’s expectation is Mary’s claim.

c. John claims what Mary claims.

Towards an analysis:

Attitudinal noun starts out in the specifier position of the (overt or silent) functional noun *thing*, as the head of the prosentential quantifier/pronoun:

(18) a. John claimed something shocking

b. John [claimi-make [ei-thing]]

Interpretation of (18a):

(19) ∃e ∃d(make(e, John, d) & claim-thing(d) & shocking(d))

Not all attitudinal object nouns are permitted to form a compound with *–thing*, in particular not *remark*, *complain* and *explain* on one reading do not (i.e. verbs that do not allow complements):

(20) a. \* John complaint something

b. \* John remarked something.

c. . John explained something (only fact-quantificational reading, i.e. object of the explanation, not content of the explanation)

(21) \* remark-thing, \* complain-thing

The underlying structure of (17c) (with the kind-denoting versions of the noun):

(22) John claimkind-make ~~claim~~~~kindi~~- what-thingj Mary claimkind-make ~~claim~~~~kind~~-ej.

The semantics forces the attitudinal objects to be of the same kind.

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**5. The semantics of modal sentences**

(23) a. John needs to leave.

b. John has a need to leave.

c. ∃e∃d(have(e, John, d) & need(d) & [*John to leave*](d))

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**6. Predicates of facts, states of affairs, and truthmakers**

**6.1. Facts**

(24) a. John regrets that S.

b. John regrets the fact that S.

c. John regrets partly (Nfact that S).

- Substitution permitted

- Referential (DP) status of factive complements (Kastner 2015)

(25) a. That S is unexpected.

b. John is anger / happy that S

c. the unexpectedness (of the fact) that S

d. John’s anger (at the fact) that S.

How can CPs denote facts? Presence of a light noun FACT in the specifier position of C:

(26) [FACT [that S]]

**6.2. States of affairs**

(27) a. That S is likely.

b. the likelihood (of the situation in which) (that) S

(28) [SOA that S]

Facts and states of affairs as modal objects

The fact that S:

the modal object whose satisfiers are just the actual situations that make S true.

The states of affairs in which S:

the modal object whose satisfiers are just the situations that make S true.

**6.3. Sentences as predicates of truthmakers**

Verbals and nominal constructions (Moltmann 2007, 2015, 2021, Bondarenko, SALT talk 2021)

(29) a. It has never occurred that John was late

b. It has once happened that John was late.

(30) The case in which John was late.

(31) [*That S/in which* S] = λs[s ∈ [S]]

Depending on the value of v, the set S of truthmakers of a sentence (IP) is mapped onto a property of attitudinal/modal objects by one of these functions:

(32) a. cont(S) = λd[the elements of S are exactly the satisfiers of d] [+cont]

b. fact(S) = λd[the true elements of S are exactly the satisfiers of d] [+fact]

c. id(S) = λd[for some element d’ of S, d = d’] [+id]

*claim* [+cont]

*notice* [+fact]

*occur/happen* [+id]

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**7. Possible extension to wh-clauses and infinitival clauses**

Additional assumption:

A wh-clause such as *who came* has as its satisfiers locutionary objects, or, more generally, truth-directed objects d whose satisfiers in turn are the truthmakers of *a came* for a relevant entity a.

(33) a. John asked who came. [+cont],

b. John wondered who came. [+fact’]

c. John told me who came. [+id]

Extension to infinitival clauses

infinitives denote sets of actions of the relevant agent:

(34) a. John requested to run. [+cont]

b. John managed to run. [+id]

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**8. Conclusion**

Clauses always be viewed as predicates:

* of attitudinal and modal objects
* of facts and states of affairs (special modal objects)
* of truthmakers (situations)

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