Workshop *The Semantics of Embedded Sentences*

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**Infinitival Clauses: Possible Worlds and Truth Maker Approaches**

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**1. The standard view and the new view of attitude reports and modal sentences**

**The Relational Analysis of attitude reports**

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

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

The roles of propositions

- primary bearers of truth values

- the meanings of sentences / embedded sentences

- the contents or ‘objects’ of propositional attitudes

Problems for propositions

- The graspability of abstract propositions

- The truth directedness of abstract propositions

Linguistic plausibility of the analysis

- the Substitution Problem

- Nominal constructions

(2) a. John’s thought that S / the thought that S.

 b. John had the thought that S.

**The Quantificational Analysis of modals**

 (3) a. John is allowed to to leave.

 b. ∃w (w ∈ f(wo) & [*John leave*]w = true)

(4) a. John needs to leave.

 b. ∀w(w ∈ f(wo) → [*John leave*]w = true)

The challenge: connections between attitude verbs and modals

**The new view: sentences as predicates of attitudinal and modal objects**

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

 b. John has the thought that Mary is happy.

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

(6) a. John needs to leave.

 b. John has the need to leave.

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

 (7) a. John’s thought that S

 b. ιd[thought(d, John) & [*that* S](d)]

A further motivation of the account:

Underspecification of the content of an attitude by the complement clause

(8) Fiona wants to PRO catch a fish. (Fara Graff 2013)

Attitudinal objects carry full satisfaction conditions, the complement clause need not do so.

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**2. How do complement clauses characterize the content of an attitude?**

**[1] Structure and form**

- Complements of *say* and *think* (verbs of saying)

- Direct quotes as complements of verbs of saying and illocutionary verbs

[2] Satisfaction conditions

Satisfaction-based sentence meanings:

(9) a. John (implicitly) believes that Mary is happy.

 b. ∃e(believe(e, John) & [*that* *Mary is happy*](product(e)))

Possible worlds semantics:

(10) [*that* S] = λd[∀w(w ∈ f(d) 🡪 S is true in w)]

Truthmaker semantics:

(11) Satisfaction-based sentence meaning (first version)

 [*that* S] = λd[∀s(s ╟ d 🡪 s ╠ S)]

╟ : exact truthmaking or satisfaction, ╠ : inexact truthmaking

For a situation or action s ╟ S d iff s is wholly relevant for the satisfaction of d.

**[2] Modal predicates**

*Must, may, should, ought to, need to, is obliged to, is necessary, is possible*

The approach

Clausal complement, clausal ssubject or prejacent have the same function in modal sentences as in attitude reports: they act as predicates of the *modal object* and characterize it in terms of its satisfaction conditions.

Modal objects for deontic modals: permissions, obligations, offers, invitations, needs

take modal products as implicit argument whose satisfiers are actions

(12) a. John needs to leave.

 b. ∃d(need(d) & [*John leave*](d))

 (13) a. John is allowed to leave.

 b. ∃d(is allowed(d) & [*John leave*](d))

Possible worlds version

Modal objects are associated with a set of alternative / worlds

Sentential unit associated with a modal:

(14) [S] = λd[∀w(w ∈ (d) 🡪 S is true in w)]

Locate difference between infinitival and finite clauses in the modality associated with the attitude verb?

(15) a. John decided that he was sick.

 b. John decided to leave.

(16) a. John intends / want / hopes to leave.

 b. John intends / hopes / that he will leave.

Finite clause: Epistemic modality

Infinitival clause: Priority modal

(17) a. [*that* S] = λd[∀w(w is an epistemic alternative associated with d 🡪 S is true in w)]

 b. [ *to* VP] = λd[∀w(w is a priority alternative associated with d 🡪 S is true in w)]

The difficulty

Distinguish modals of necessity and of possibility

(18) a. John is obliged to leave.

 b. John is allowed to leave.

(19) a. It is possible for John to leave.

 b. It is necessary for John to leave.

Make infinitival clauses ambiguous?

(20) [to VP] = λd[∃w(w is a priority alternative associated with d & S is true in w)]

bad move (noncompositional semantics), also would not work for explicit permissions

Difference between deontic *may* and *must*

*must*: modal product (obligation) has both satisfiers and ‘violators’

satisfiers: actions of John’s helping by way of fulfilling the obligation

violators: actions incompatible with John’s helping

*may*: modal product (permission, say) has only ‘satisfiers’

(21) Satisfaction-based Sentence Meanings (second version)

 [S] = λd[∀s(s ╟ d → s ╠ S ) & ∀s(s ╢ d → s ╣ S)]

╢: exact violation, ╣: inexact falsemaking

(22) a. John asked Mary to come.

 b. John invited Mary to come.

(23) a. ∃e(ask(e, John, Mary) & [*Mary come*](product(e)))

 b. ∃e(invite(e, John, Mary) & [*Mary come*](product(e)))

 c. [*Mary come*] = λd[∀s(s ╟ d → s╠ *Mary come* & ∀s(s ╢ d → s ╣ *Mary come*))]

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**3. Another application: ‘harmonic ‘ modals**

(24) a. John requested that Mary *should* leave.

 b. John offered Mary that she *could* use the house.

(25) a. The document indicates that Bill *might* be guilty.

 b. John suggested that Bill *might* be at home.

Analysis:

Occurrence of modal is a performative use of a modal in an embedded context:

(26) a. [*that Mary should leave*] = λd[should(d) & [*Mary leave*](d)]

 b. ∃e(request(e, John) & [*that Mary should leave*](product(e)))

(27) a. [*that Bill might be guilty*] = λd[might(d) & [*Bill be guilty*](d)]

 b. ∃e(indicate(e, the document) & [*that Bill might be guilty*](modal-product(e))))

The more standard account (Kratzer, recent talks):

‘Harmonic’ modal in the embedded clause spells out universal quantification over possible worlds characterizing the content of an object of the sort of a belief, a claim, an offer.

(28) a. John requested that Mary should leave.

 b. λd[∀w(w ∈ fdeont(d) → [*Mary leave*]w = true)]

(29) a. The document indicates that Bill might be guilty

 b. λd[∃w(w ∈ fepist(d) & [*Bill be guilty*]w = true)]

(29b) does not make sense.

Cannot account for ‘harmonic’ modals of possibility

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