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*Act-Based Conceptions of Propositional Content*

Handout 4

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**Attitudinal and Modal Objects and the Semantics of Attitude Reports and Modal Sentences**

**1. Clauses as predicates of attitudinal and modal objects**

Davidsonian event semantics

Cognitive and illocutionary products are products of Davidsonian event arguments.

Mental states are themselves Davidsonian event arguments (and their own ‘products’).

Function of *that*-clauses

predicates of the products of Davidsonian event arguments

Different ways for clauses to characterize attitudinal or modal objects

- specify composition of product in terms of smaller products: concept-conveying products, predicational products, referential / identificational products etc.

- specify truthmakers / satisfiers of attitudinal objects

- combination of both

The general logical form of attitude reports

(1) a. John thought that S

 b. ∃e(think(e, John) & [*that* S](product(e)))]

 c. John has the thought that S.

 d. ∃d(have(John, d) & thought(d) & [*that* S](d))

Ways for sentences to characterize attitudinal products

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

 b. [*that Mary is happy*] = λd [d consists of a referential product involving the use of

 ‘Mary’ and a predicational product involving the use of the concept ‘happy’]

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

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

 b. Satisfaction-based derivative sentence meaning (first version)

 sat([*that* S]) = λd[∀i(i ╟ d 🡪 i ╠ S)]

 ╟ : exact truthmaking, ╠ : inexact truthmaking

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

Semantics of sentences applicable to all sorts of attitudinal objects

No commitment to the internal structure of products – except for those of utterances of independent sentences

The semantics of ‘special’ quantifiers and pronouns

(4) a. John said something nice.

 b. ∃e∃e’(say(e, John) & nice(e’) & e’ = product(e))

(5) a. John thought what Mary thought.

 b. ∃e∃e’∃e’’(think(e, John) & e’ = product-kind(e) & think(e’’, Mary) & e’ = product-

 kind(e’’))

The semantics independent sentences

 Independent sentences express properties of illocutionary products, specifying their structural composition in terms of smaller products -- referential / identificational products, predicational products, modificational products etc.

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**2. The underspecification of attitudinal objects by sentences predicated of them**

Attitudinal objects are causally relevant and carry full satisfaction / truth conditions.

Clausal complements may underspecify attitudinal objects with respect to their content.

**2. 1. Attitudes *de se***

Attitudes *de se* as involving self-ascriptions of a property (Lewis 1979):

(6) a. John thinks that he himself is a hero.

 b. John hopes [PRO to become a hero].

Stalnaker (1981): Contents of attitudes *de se* are truthconditionally complete:

(7) John thinks that he himself is a hero, which is true. / That is true.

Observation:

The products of attitudes *de se* are in fact truth-conditionally complete:

John’s belief that he himself is a hero is either true or false.

John’s hope to become a hero can be fulfilled or not. Attitudinal objects are true or false even Products of self-ascriptions are truth conditionally complete, while what is ascribed is not.

**2.2. Temporal and location operators**

Lewis (1980):

The roles of ‘objects of propositional attitudes’ and ‘objects that temporal and location operators operate on’ cannot be fulfilled by one and the same thing.

Objects of attitudes must be truth-conditionally complete, but temporal and spatial operators operate on truth-conditionally incomplete contents, properties of time and of location, to be ascribed to the agent’s own time or location in a propositional attitude that is ‘de se’ regarding the attitude’s time or the agent’s location.

Observation:

‘Products’ of ascriptions of properties of times / locations to the time / location in question are truth-conditionally complete:

‘John’s belief that Mary will like Bill’, involving future temporal operator, is truth-conditionally complete.

**2.3. ‘Unarticulated constituents’**

 (8) a. Pierre believes that Londres is pretty, and he believes that London is not pretty.

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

(9) a. ∃e(believe’(e, Pierre) & [*that London is pretty*](e))

 b. ∃e(believe’(e, Pierre) & [*that London is not pretty*](e))

A refinement

A difficulty for modes of presentation being part of the cognitive product

(10) John believes that Paris is beautiful.

 Mary believes that Paris is beautiful.

 John and Mary belief the same thing.

*The same thing* stands of a kind of product whose instances are exactly or closely similar, thus should not involve different modes of presentation for Paris.

The notion of a background of a product

represents presuppositions of a cognitive product, the content of background beliefs or other attitudes.

Coordination (in the sense of Fine 2007) as a relation among referential products

Referential products in a cognitive product may be coordinated with referential products in the background of the cognitive product.

John’s and Mary’s beliefs involve different backgrounds.

John’s and Mary’s referential products involving *Paris* are coordinated with different referential products in the different backgrounds of their beliefs.

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**3. Modals as predicates of modal objects**

The standard, quantificational account of modals

Modal logic: Modals represent quantifiers ranging over (accessible) possible worlds

Kratzer (1977): contextually given modal base (set of worlds) and ordering source (set of ideal worlds inducing ordering among worlds)

(11) a. John may leave.

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

(12) a. John must leave.

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

Kinds of modal predicates

(13) a. might, may, must, should (modal auxiliaries)

 b. ought to, need to, have to (modal verbs)

 c. is possible that, is necessary that, is able to, is capable of (modal adjectives)

Two semantic issues regarding modal predicates

[1] What do nominalizations of modal predicates describe?

[2] What if any is the Davidsonian (event) argument of modal predicates?

The present approach

Answers to 1 and 2 shed light on the semantics of modal verbs and motivate the view that

modals are predicates of ‘modal objects’, the Davidsonian arguments of modal predicates.

The semantic proposal

(14) a. John needs to leave.

 b. John has a need to leave.

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

(15) a. John is permitted to leave.

 b. John has a permission to leave.

 c. ∃d(is permitted(d, John) & [*John to leave*](d))

Harves / Kayne (2012): (14a) is derived from (14b).

How can clauses act predicates of modal objects?

They specify the satisfiers and violators of the modal object (in roughly the sense Kit Fine’s (2912, 1914, to appear) truthmaker semantics).

Satisfiers: situations or actions fulfilling or complying with the modal object

Violators: situations or actions incompatible with or contravening the modal object

Difference between modals of necessity and of possibility

Modal objects of necessity: have satisfiers and violators

Modal objects of possibility: have only satisfiers

No difference in terms of quantification!

Semantic connections between attitude verbs and modal verbs

Modal objects may share satisfiers with attitudinal objects:

Need, obligation – request

Permission – permission (on the part of…, as an illocutionary product)

Deontic modal verbs

 (16) a. John must help.

 a’. ∃e(must(e) & [*John help*](e))

 b. John may leave.

 b’. ∃e(may(e) & [*John leave*](e))

Epistemic modal verbs – approximatively:

(17) a. John must be at home.

 b. λe[∃d (dRe & must(d) & [*John be at home*](d))]

e: speech event, R: ‘close connection’

epistemic modals as ‘quasi-performatives’

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**4. The formal semantics of modals based on modal objects**

**4.1. Modal objects as bearers of satisfaction conditions and of satisfiers**

(18) a. John’s need was fulfilled by having X be done.

 b. The obligation was met by doing X.

 c. The offer was taken up / was accepted.

**4.2. Fine’s (2012, 2014, to appear) truthmaker semantics**

(Exact) truthmaking

A situation is an exact truthmaker of a sentence S iff s is wholly relevant for the truth of S.

The meaning of a declarative sentence S

 the set of its verifiers (pos( S)) and the set of its falsifiers (neg( S))

(Exact) satisfaction for the semantics of imperatives:

Exact satisfaction as relation between an action and an imperative

The meaning of an imperative

the set of its satisfiers (actions complying with the imperative) and the set of its violators (actions contravening the imperative)

Standard truthmaking conditions

(19) a. s ╟ P *and* Q iff for some s’ and s’’, s = sum(s’, s’’) and s’ ╟ P and s’’ ╟ Q.

 b. s ╟ P *or* Q iff s ╟ P or s ╟ Q

 c. s ╟ ∃x S iff s ╟ S [x/t] for some term t

(Exact) falsemaking for the truthmaking condition on negative sentences:

s ╢ S: S is false in virtue of s

(19) d. s ╟ *not* S iff s ╢ S.

**4.3. Modal objects and their satisfaction and violation conditions**

Modal objects as entities with satisfaction conditions and satisfiers and violators:

John’s obligation to help

satisfiers: actions fulfilling the obligation,

violators: actions incompatible with the fulfillment of the obligation

John’s offer to help

has only satisfiers: actions of John’s helping

John’s permission to leave

has only satisfiers: actions of John’s leaving

(20) a. John must help.

 a’. ∃e(must(e) & [*John help*](e))

 b. John may leave.

 B’. ∃e(may(e) & [*John leave*](e))

Difference between deontic modals of obligation and permission

Obligations have satisfiers and violators, permissions have only satisfiers

(21) (Derived) Sentence Meanings as Properties of Attitudinal and Modal Objects (second

 version)

 sat’([S]) = λd[∀s(s ╟ d → s ∈ pos(S)) & ∀s(s ╢ d → s ∈ neg(S))]

Accounting for the duality of modals of possibility and modals of necessity

must ¬ S ↔ ¬ may S

A modal product whose satisfiers make S false and whose violators make S true is not a modal product that has only satisfiers that make S true, and vice versa.

Application to illocutionary products of obligation and permission

(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 comeemb*] = λd[∀s(s ╟ d → s ∈ pos(*Mary come*)) & ∀s(s ╢ d →

 s ∈ neg(*Mary come*))]

Application to other modalities

Ability modals

(24) John is able to walk.

Satisfiers of an ability: its physical manifestations

Abilities have only satisfiers, not violators

Epistemic modals

Evidence, accepted facts, ‘common ground’ ‘generate’ two sorts of modal objects:

- modal objects of possibility, objects whose satisfiers are situations supported by the evidence, facts, common ground)

- modal objects of necessity, objects whose satisfiers are situations supported and whose violators are excluded by the evidence, facts, common ground

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**5. Connections between modals and propositional attitudes**

Inferences with modal auxiliaries

(25) a. John asked Mary to leave.

 Mary must leave.

 b. John offered Mary to take an apple.

 Mary may take an apple.

Inferences with terms for modal objects

(26) a. Yesterday John permitted Mary to leave.

 b. Today, Mary still has the permission to leave.

(27) a. Yesterday John offered Mary to use the car.

 b. Today Mary still has the offer to use the car.

(28) a. John promised to help.

 b. John has the obligation to help.

(29) a. John invited Mary to come to his house.

 b. Mary has the invitation to come to John’s house.

Explaining the valid inferences

The illocutionary act produces both a (non-enduring) illocutionary product and an (enduring) modal object.

The illocutionary product and the modal object share exactly the same satisfiers (and possibly violators).

Two interpretations of (26a):

Involving the non-enduring illocutionary product:

(26) c. ∃e(permit(e, John, Mary) & [*Mary to leave*] (product(e)))

Involving the enduring modal product:

(26) d. ∃e(permit(e, John, Mary) & [*Mary to leave*] (modal-product(e)))

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**6. Modal Concord**

(27) a. John could possibly have missed the train.

 b. John must obligatorily fill out the form.

 c. John may optionally fill out the back of the form.

Analysis: Modal adverbs as predicates of modal objects:

(28) ∃d(must(d) & obligatorily(d) & [*John fill out the form*](d))

Constraint: modal has to be of the same sort:

(29) a. ??? John must possibly have missed the plane.

 b. ??? John may obligatorily fill out the form.

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**7. Performative uses of modals**

(30) a. I hereby ask that you leave.

 b. You must leave.

 c. Leave!

(31) a. I hereby offer you to take an apple.

 b. You may take an apple.

 c. Take an apple!

Independent sentences as predicates of illocutionary products or modal products produced by illocutionary acts

Semantics of performative uses of independent sentences:

(32) a. λe[ask(e, speaker) & [(addressee)  *leave*](product(e))]

 b. λd[must(d) & [ (addressee) *leave*](d)]

 c. λd[[*leave!*](d)]

(33) a. λe[offer(e, s) & [(addressee) *take an apple*](product(e))]

 b. λd[may(d) & [(addressee) *take an apple*](d)]

 c. λd[[*leave!*]*(*d)]

(34) [S !] = λd[∀a(a ╟ d → a ∈ pos(S)) & ∀a(a ╢ d → a ∈ neg(S))]

Performative uses of modals in embedded contexts

(also considered cases of ‘modal concord’ or ‘harmonic modal’):

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

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

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

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

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

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