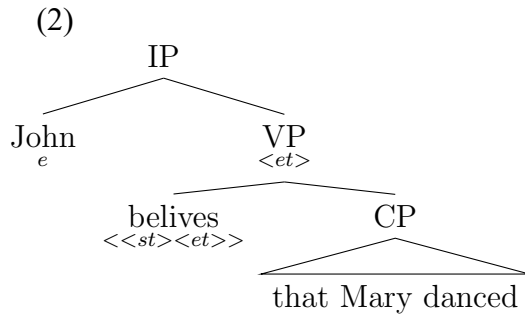


Decomposition of attitude predicates

Moulton, Keir. 2015. 'CPs: Copies and Compositionality' Linguistic Inquiry

1. The classic view on the syntax and semantics of attitude verbs and its issues

(1) John believes that Mary danced.



(3) $[[\text{believes}]]^{w_0} = \lambda p. \lambda x. \forall w [w \in \text{Dox}(x, w_0) \rightarrow p(w)]$

(4) $[[\text{believes}]] (\lambda w. \text{Mary danced in } w) (\text{John})$

(5) $[[(2)]]^{w_0} = \text{T iff } \forall w [w \in \text{Dox}(\text{John}, w_0) \rightarrow \text{Mary danced in } w]$

2. The semantic puzzles for the classic picture.

2.1 Nouns and propositions

Fact 1. Propositions can be predicated of some nouns.

- (6) The rumor is that Mary danced.
- (7) The story is that Mary danced.
- (8) The idea is that Mary danced.
- (9) The problem is that Mary danced.

Option 1:

'Is' is a copular of identity. However:

- (6) is T iff $[[\text{the rumor}]] = [\lambda w. \text{Mary danced in } w]$
- (7) is T iff $[[\text{the story}]] = [\lambda w. \text{Mary danced in } w]$
- (8) is T iff $[[\text{the idea}]] = [\lambda w. \text{Mary danced in } w]$
- (9) is T iff $[[\text{the problem}]] = [\lambda w. \text{Mary danced in } w]$

A. Kratzer:

- (10) The rumor is mean (propositions cannot be mean)
- (11) The story is long and boring (propositions cannot be long and boring)
- (12) The idea is exciting (propositions cannot be exciting)

(13) The problem is hard (propositions cannot be hard)

Option 2:

- This copular is a copular of predication.
- The CP ‘that Mary danced’ is a proposition (type $\langle s, t \rangle$).

However:

- In this view, ‘the rumor’ or ‘the story’ would refer to a specific possible world.
- That is implausible: ‘the story that Mary danced’ does not seem to provide enough information to differentiate a specific world. There are lots of worlds where Mary danced.

The core idea (Kratzer 2006, 2013):

- We introduce a new semantic type c (content individuals).
- Rumors, ideas, stories, problems are special entities that can carry content.
- They are not identical to their content; thus, they can be mean, old, long, and boring.

(14) $\llbracket \text{idea} \rrbracket = \lambda x_c. \lambda w. x_c$ is an idea in w

(15) $\llbracket \text{the}_{w1} \text{ idea} \rrbracket = \iota x_c [x \text{ is an idea in } g(1)]$

- ‘The idea’ is both of type c and of type e .
- Given (6)-(9) *that*-clauses must denote something similar.
- We define a special function CONT that take an individual and the evaluation world and returns a set of possible worlds compatible with the content of that individual.

(16) $\text{CONT}(x_c)(w) = \{w' : w' \text{ is compatible with the content of } x_c \text{ in } w\}$

- Complementizers are functions that take propositions and return things whose content is that proposition.

(17) $\llbracket C \rrbracket = [\lambda p. \lambda x_c. \lambda w. [\text{CONT}(x_c)(w) = p]]$

(18) $\llbracket \text{Mary danced} \rrbracket = \lambda w. \text{Mary danced in } w$

(19) $\llbracket \text{that Mary danced} \rrbracket = \lambda x_c. \lambda w. [\text{CONT}(x_c)(w) = \lambda w'. \text{Mary danced in } w']$

- ‘that Mary danced’ is of type $\langle c, st \rangle$!

We got the explanation for the copular construction: the (type e or c) subject DP is predicated of the $\langle e, st \rangle$ type CP (taking be as vacuous).

- (20) $\llbracket \text{the idea is that Mary danced} \rrbracket = \lambda w. [\text{CONT}(\iota x_c [x \text{ is an idea in } w])(w) = \lambda w'. \text{Mary danced in } w']$

Fact 2. Propositions can appear inside DP!

Now we can also straightforwardly account for things like (21):

- (21) The rumor that Mary danced is unbelievable.

- (22) $\llbracket \text{the}_{w1} [\text{rumor} [\text{that Mary danced}]] \rrbracket$

‘Rumor’ and ‘that Mary danced’ have the same semantic type. They can combine via predicate modification.

- (23) $\llbracket \text{rumor} \rrbracket = \lambda x_c. \lambda w. x_c \text{ is a rumor in } w$

- (24) $\llbracket \text{that Mary danced} \rrbracket = \lambda x_c. \lambda w [\text{CONT}(x_c)(w) = \lambda w'. \text{Mary danced in } w']$

- (25) $\llbracket \text{rumor that Mary danced} \rrbracket = \lambda x_c. \lambda w. x_c \text{ is a rumor in } w \ \& \ \text{CONT}(x_c)(w) = \lambda w'. \text{Mary danced in } w'$

- (26) $\llbracket \text{the}_{w1} \text{ rumor that Mary danced} \rrbracket = \iota x_c [x_c \text{ is a rumor in } g(1) \ \& \ \text{CONT}(x_c)(g(1)) = \lambda w'. \text{Mary danced in } w']$

Fact 3. Some of the attitude verbs combine with Content DPs!

Now, some of the attitude verbs combine with Content DPs!

- (27) John believes the rumor that Mary danced.

- (28) John reported the rumor that Mary danced.

This means we need the following entries for them:

- (29) $\llbracket \text{believe} \rrbracket = \lambda x_c. \lambda y. \lambda w. y \text{ believes } x_c \text{ in } w$

- (30) $\llbracket \text{John believed the rumor that Mary danced} \rrbracket = \lambda w. \text{John believes in } w [\iota x_c [\text{rumor}(x_c)(w) \ \& \ \text{CONT}(x_c)(w) = \lambda w'. \text{Mary danced in } w']$

Fact 4. Attitude verbs combine ‘so’, but nouns don’t.

(31) John believes so.

(32) *The belief so

‘So’ is a referential expression that refers to an entity with content.

(33) $[[so]_1] = g(1)$

(34) $[[(31)]^g = [\lambda x_c. \lambda y. \lambda w. y \text{ believes } x_c \text{ in } w](g(1))(John) = \lambda w. \text{John believes } g(1) \text{ in } w]$

(35) $[[belief]] = \lambda x_c. \lambda w. x_c \text{ is a belief in } w$

(36) $[[belief \text{ so}]] = \lambda w. (g(1)) \text{ is a belief in } w$

(37) $[[the]] = \lambda P_{\langle s, ct \rangle}. \lambda w. \iota x [P(x)(w)]$

(38) $[[the \text{ belief so}]] \text{ Clash!}$

So what about (39)?

(39) John believes that Mary danced.

2. Intensional verbs never take a proposition as their argument

Propositional attitude verbs do not take a proposition or the denotation of a CP their argument.

Evidence from nominalization

There is a similarity between the behavior of the content nouns and the nominalizations of the attitude verbs.

(40) The belief is that Mary danced.

(41) The claim is that Mary danced.

(42) The complaint is that Mary danced.

(43) The suspicion is that Mary danced.

There is a special type of nominalization in English ‘object nominalization’ (Grimshaw 1990), where the denotation of the noun is the theme of the nominalized verb.

(44) Assignment = ‘the thing that is assigned’

Different types of object nominalizations have different properties.

- Argument structure nominal (ASNs)
Can take modifiers like ‘in three hours’ ‘for several weeks’

(45) The total destruction of the city in two days appalled everyone.

(46) Only observation of the patient for several weeks can determine the most likely course of action.

- Non-argument structure nominal (NASNs)

Do not take internal argument and cannot be modified by modifiers:

(47) *The total destruction in two days was widespread.

(48) *Only observation for weeks can determine the best course of action.

Generalization: only if a nominalization has an internal argument, it is possible to add a temporal modifier like in two days.

We can use this to test for the presence of an internal argument in attitude report nominalizations

(49) I decided that he was a fraud in 5 minutes.

(50) *My decision that he was a fraud in 5 minutes was impressive.

(51) *My decision in 5 minutes that he was a fraud was impressive.

(52) John proved that he was competent in only a few minutes.

(53) *John's proof that he was competent in only a few minutes impressed me.

(54) *John's proof in only a few minutes that he was competent impressed me.

(55) I explained in under an hour that I was innocent.

(56) *My explanation that I was innocent in under an hour annoyed everyone

(57) *My explanation in under an hour that I was innocent annoyed everyone.

(58) John claimed for years that the earth was flat.

(59) *John's claim for years that the earth was flat annoyed me.

(60) John believed that the snow is green for 10 years.

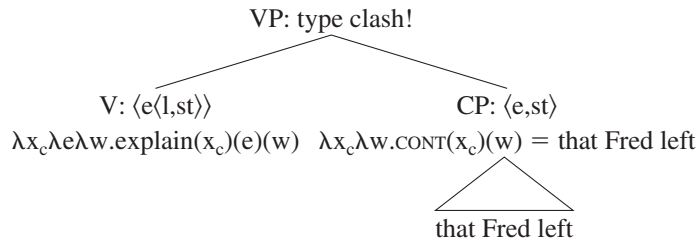
(61) *John's believe that the snow is green for 10 years annoyed me.

- Their CP complement is not an argument, otherwise we could do the modification with a temporal adverbial.

- This supports the idea that the underlying Vs in those cases also do not take CPs as arguments.

An attitude verb looks for an argument of type e (the one with a propositional content) and it cannot compose with a CP!

(62)



3. How do attitude verbs compose with *that*-clauses?

‘Remnant movement’:

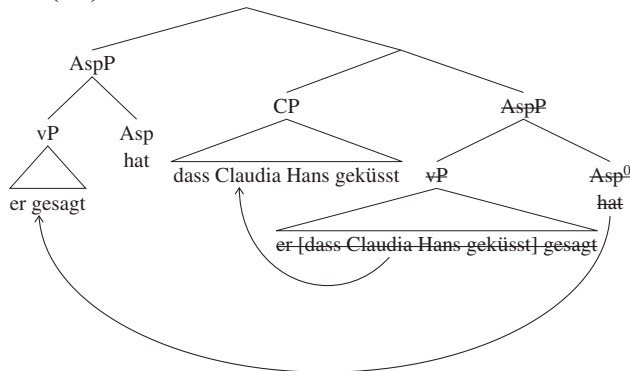
There is a movement of a CP followed by the movement of a VP that syntacticians observed long ago.

Zwart (1993):

(63)

- a. ... weil er gesagt hat [_{CP} dass Claudia Hans geküsst hat].
... because he said has that Claudia Hans kissed has
‘... because he said that Claudia kissed Hans.’
- b. *... weil er gesagt [_{CP} dass Claudia Hans geküsst hat] hat.
... because he said that Claudia Hans kissed has has

(64)

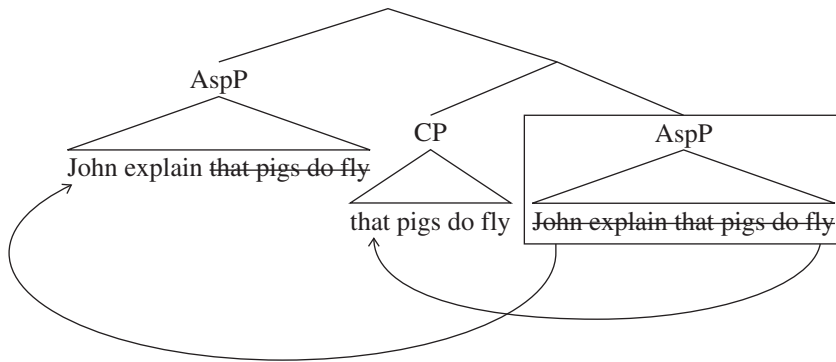


In English:

CP arguments, unlike DPs, must appear after other arguments and verbal modifiers.

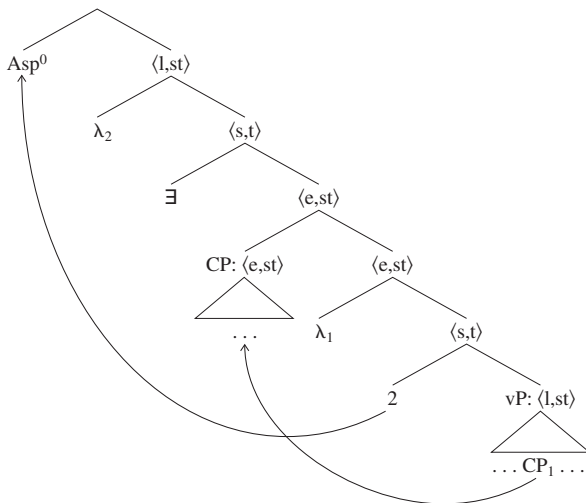
- (65) Did [Sally’s mentioning to the doctor that there will be a problem] surprise you?
- (66) *Did [Sally’s mentioning that there will be a problem to the doctor] surprise you?
- (67) Did [Sally’s saying quietly that there will be a problem] surprise you?
- (68) *Did [Sally’s saying that there will be a problem quietly] surprise you?

(69)



Moulton: this movement is needed to resolve the type mismatch.

(70)

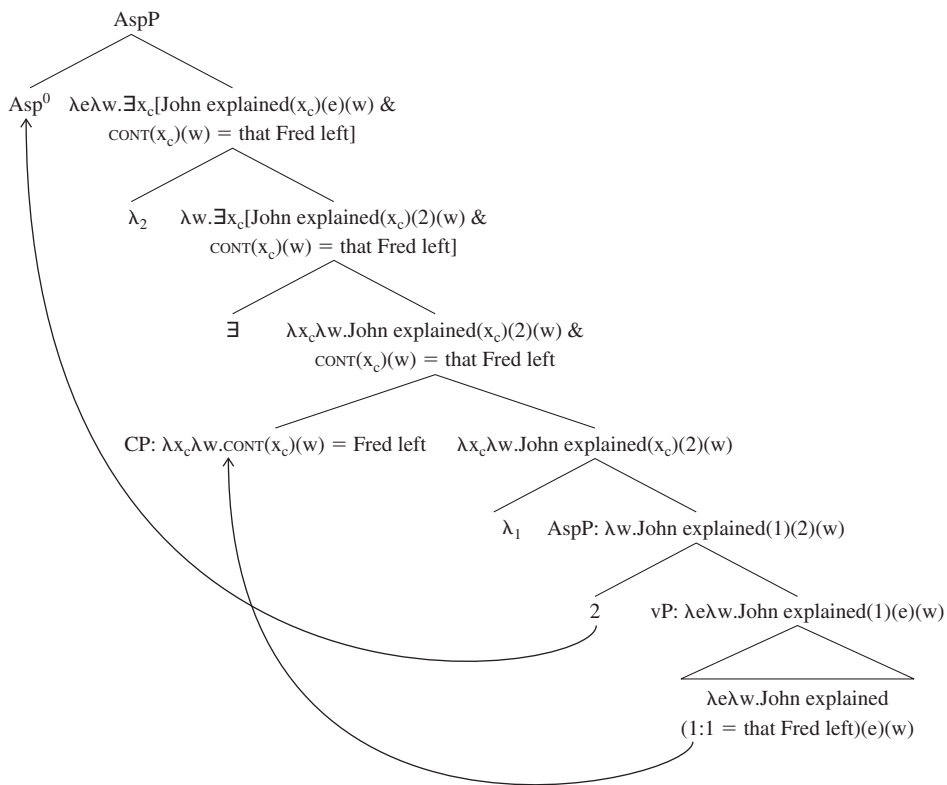


- (71) $[[\text{perfect}]] = \lambda P_{\langle l, st \rangle} \lambda t. \lambda w. \exists e [P(e)(w) \ \& \ \tau(e) < t]$
- (72) $[[\text{perfektive}]] = \lambda P_{\langle l, st \rangle} \lambda t. \lambda w. \exists e [P(e)(w) \ \& \ \tau(e) \sqsubseteq t]$
- (73) $[[\text{imperfektive}]] = \lambda P_{\langle l, st \rangle} \lambda t. \lambda w. \exists e [P(e)(w) \ \& \ \tau(e) \supseteq t]$

(74)

a. John explained that Fred left.

b.



(75) [complain <e, lst> CP<e,st>] – cannot compose

Now we can interpret the vP:

(76) [AspP CP [1 [AspP Asp [vP Dave [v [vP complain<c,lst> [t_{1c}]]...]]

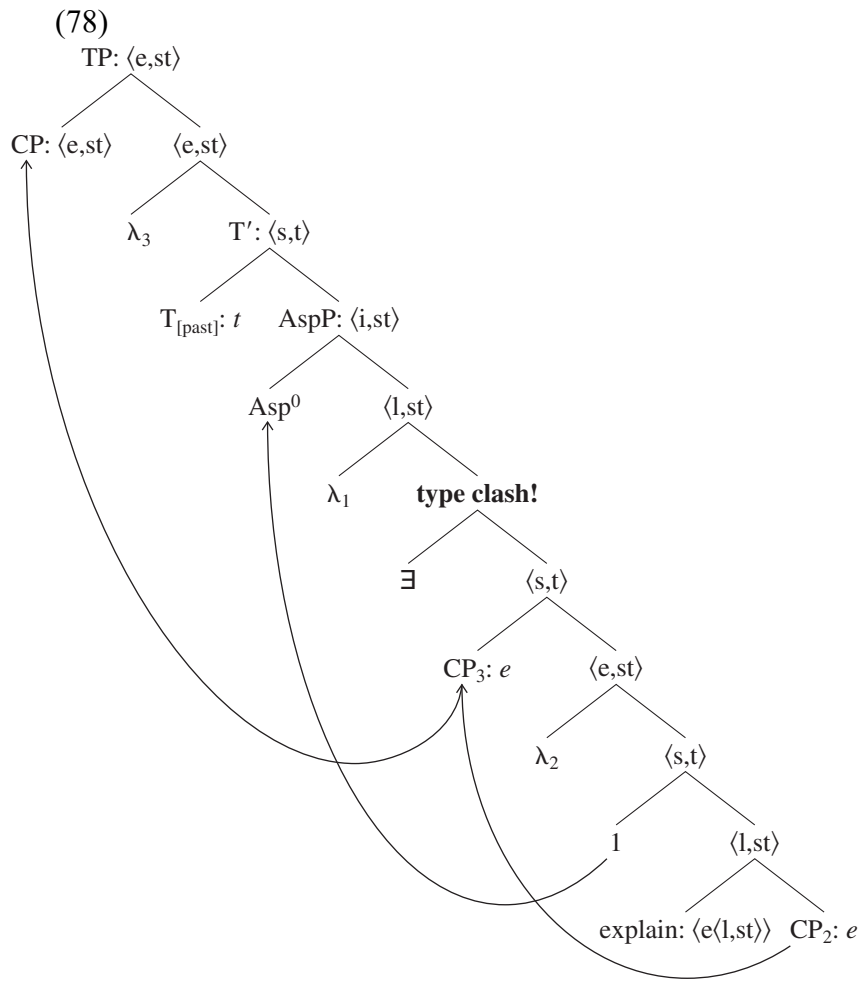
A part of the aspectual phrase reconstructs:

(77)

- a. [AspP Asp⁰ VP] ... [~~AspP Asp⁰ VP~~] PF
- b. [AspP Asp⁰] λ_{2,1} ... [AspP 2₁ VP] LF

4. Why That-Clauses Move No Further

One ingredient is the well-documented fact that EC sits at the edge of the verb phrase (Diesing 1992). This explains why the *that*-clause moves only as low as it does; if it moved further, and did not fall under EC, the composition would fail.



5. What about that-clauses that can move leftwards?

Sentential subjects and topics must rely on a DP strategy to move.

(79) *That it is raining, John complained/boasted/agreed/convinced me

(80) That it is raining, John believes/knows/expects.

(81) John believes/knows/expects that it is raining.

(82) John believes/knows/expects that.

(83) John complained/boasted/agreed/convinced me that it is raining.

(84) *John complained/boasted/agreed/convinced me that.

(85)

a. [that Fred left] $Op_{\lambda x_c}$ John could not believe x_c

b. $\lambda w \exists x_c [[\text{CONT}(x_c) = \text{Fred left}] \ \& \ \text{John could not believe } x_c \text{ in } w]$

6. Crosslinguistically

Some clauses can be saturators.

Korean:

- *ko*-clauses do not need to move
- *ko*-clauses cannot combine with content nouns
- They have the same type as 'so'

(86)

- a. Mina-ka [Swuna-ka ku mwuncey-lul phwul-ess-ta]-**ko**
Mina-NOM Swuna-NOM that problem-ACC solve-PAST-DECL-C
cwucangha-yess-ta.
claim-PAST-DECL
'Mina claimed that Swuna solved the problem.'
- b. *[Swuna-ka ku mwuncey-lul phwul-ess-ta]-**ko** cwucang
Swuna-NOM that problem-ACC solve-PAST-DECL-C claim
'the claim that Swuna solved the problem'
(Chung-hye Han, pers. comm.)

- English exceptional case-marking (ECM) complements appear to be in-situ saturating clausal arguments, too.
- This is confirmed by their inability, in which they contrast with *that*-clauses, to combine with NASNs

(87) *Sue's belief (of) Mary to be wicked cool.