

D+CP

Propositional DPs

Keir Moulton

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1 What we're doing

- We decided last time that in Greek, Roussou's arguments for *to+oti* as D+CP don't totally go through.
- Greek (*to+oti*) and Spanish (*lo+de+CP*) could very likely involve null Ns

But the Spanish *el+que* construction is a pretty convincing case of a true D+CP construction without an null N.

- recall that *el+que* is distinct from *Lo+de+que* constructions which:
 - must have a *de*, expected if there is a N (*el+que* can't have *de* unless N ellipsis happens)
 - can be arguments of true proposition-taking predicates (*is a lie*) which *el+que* cannot

el+que constructions can be arguments of verbs that (at least in English) otherwise select for derived nominals (DNs) and gerundives:

- (1) Places where *el+que* goes = places where English gerundives go:
 - a. __ pleases X
 - b. __ is surprising
 - c. __ lacks logic
 - d. regret __
 - e. __ shows
 - f. __ seem important/irrelevant/amazing
 - g. demonstration/observation of __
 - h. __ made him suspect to the police
 - i. __ triggered
- (2) e.g. Mary's arrival/Mary('s) arriving was surprising.

El+que is likewise not possible in places where derived nominals (DNs) and gerundives are not licensed: the standard propositional attitude verbs:

- (3) Places where *el+que* does not go = places where English gerundives do not go:
 canonical attitude verbs and verba dicendi (believe, say)
 epistemic factives (know, see)
 truth-predicate (is false, is true, is a lie)
- (4) **[El que María haya comprado/compró una casa nueva] es una mentira.*
 The that Maria has.SUBJ bought/bought.INDIC a house new is a lie
 ‘That Maria has bought a new house is a lie.’ (P. Menéndez-Benito, p.c)
- (5) **Dijo/pensa/sabe el que María estaba en la tienda.*
 said/thought/knew.3SG the that M. was in the store
 ‘He/she said/thought/knew that Maria was in the store.’ (P. Menéndez-Benito, p.c)

One difference though: DNs/gerundives are licensed as direct perception complements, *el+que* is not:

- (6) **Vi el que María estaba bailando.*
 Saw the that Maria was dancing.
 ‘He saw that Maria was dancing.’

What do *el+que* clauses denote?

- I think there’s some similarity between *el+que* and constructions Vendler talked about and Zucchi 1989/1993 described as **propositional noun phrases**—they’re opaque but still somehow more event/situation denoting than propositions;
 - *el+que* constructions sit under many of the same verbs and are likewise opaque but not used as “fully” propositional arguments.
- What follows reports joint work with Ilaria Frana
- I have no solutions of analysis for *el+que* constructions, but this is a start

2 Zucchi 1993

Derived nominals (DNs) (and the ING-OF types of gerunds, I believe) describe events (7) unlike *that*-clauses, and yet they are sometimes paraphrasable/have similar distribution as *that*-clauses (“propositions”), which cannot describe events (at least, by the same criteria). We call these readings **concealed propositions** (ConPs)

- (7) Event-taking predicates

- a. **Mary's resignation/resigning from her position** was slow/long/occurred yesterday.
 - b. **#That Mary resigned** was slow/long/occurred yesterday.
- (8) Proposition-taking predicates
- a. (i) **Mary's resignation/resigning from her position** surprised us.
 - (ii) It surprised us **that Mary resigned**.
 - b. (i) They informed us of **Mary's resignation/resigning from her position**.
 - (ii) They informed us **that Mary resigned from her position**.
 - c. (i) We are aware of **Mary's resignation**
 - (ii) We are **that Mary resigned**

Paraphrases are not particularly strong evidence for much, but there *is* an intuition here.

(9) **The Ambiguity Hypothesis**

Derived nominals are ambiguous between eventualities and propositions. Depending on the selection properties of the embedding predicate, either one or the other interpretation is available (or both, if the predicate selects for both propositions and events).

2.1 Problems for the Ambiguity Hypothesis

Selection

Zucchi 1993: if the DN is ambiguous between a proposition and event, why can't remember (which takes propositions as CPs) mean the same thing with a DN complement:

- (10) John remembers Mary's arrival. (Zucchi 1993)
- (11) John remembers (the fact) that Mary arrived (because he was told so).

Factivity

(Our argument) Unlike like *know* and *be aware of*, *tell* and *inform* are not factive when their complement is a *that*-clause:

- (12) a. Julia knew that Cicero died, #when in fact he was alive.
- b. Julia was informed that Cicero died, when in fact he was alive.
- c. Antonio told Cicero that Julia arrived, when in fact she hasn't arrived.

Interestingly, when the complement of *tell* and *inform* is a DN with a propositional reading, the sentence carries a factive commitment, as shown by the fact that the examples below

feel contradictory:

- (13) a. Julia was informed of Cicero’s death, #when in fact he was alive.
 b. Antonio told Cicero of Julia’s arrival, #when in fact she hasn’t arrived.

The fact that *tell* and *inform* are factive when they occur with DNs, but not factive when they occur with propositional *that*-clauses is a mystery if they were propositions.

Sidenote: Is the factivity effect observed with ConPs is due to the existence presupposition carried by the definite, projecting out of the intensional context? We don’t think so:

- First, this would not explain the contrast between (14a) and (14b). If the markedness of (14b) were due to the fact that the presupposition of existence of the definite projects out of the intensional context, thus leading to a contradiction with the continuation, the same should be true of (14a).

- (14) a. Romeo was informed that the delivery of his love letter (to Juliet) went through, but in fact that never happened.
 b. Romeo was informed of the delivery of his love letter (to Juliet), # but in fact that never happened.

- Second, as noted in the literature (e.g., Karttunen (1973)) presuppositions that project from attitudes (15a) can be canceled as in (15b):

- (15) a. Mary believes Smith’s murderer escaped.
 [presupposition: there is a unique individual who murdered Smith]
 b. Mary mistakenly believes that someone murdered Smith, and she believes that Smith’s murderer escaped.

If the “factivity” effect is just due to the definite we should be able to cancel it in a way analogous to (15b). That this is not true is demonstrated in (16).

- (16) Mary believes that Jocasta arrived (when in fact she hasn’t). She then told me of Jocasta’s arrival.

The implication that Jocasta arrived does not seem to be canceled here, suggesting that the factivity doesn’t come from the definite, but from something else.

2.2 Zucchi’s proposal

DNs uniformly denote events and they come to “mimic” propositional interpretations—to denote ConPs in our terms—by a manipulation in the entry of the selecting verb.

- (17) a. John is informed of Mary’s arrival. (= J. is informed of the fact that M. arrived)

- b. $\llbracket \text{be informed of}_E \rrbracket = \lambda e \lambda x. \text{inform}(\text{OCCUR}(e))(x)$
- c. $\llbracket \text{inform}(\text{OCCUR}(e))(x) \rrbracket = 1$ iff x is informed that e occurred

At the core of *be informed of_E* is still the meta-language relation *inform*, which describes a relation between individuals and propositions just in the way English CP-taking *inform* does. It is just that the proposition is derived by applying the individual event argument to the predicate OCCUR. Zucchi suggests an analogous shift for predicates like *be aware of*.

The Problem of co-extensional events

- (18) Direct perception
- a. Caius witnessed the death of Caesar.
 - b. The death of Caesar is the murder of Caesar.
- \Rightarrow Caius witnessed the murder of Caesar.

ConPs are opaque, as shown in (19) (modeled after Ramsey (1927)).

- (19) DNs/ConPs
- a. Caius was informed of the death of Caesar.
 - b. The death of Caesar is the murder of Caesar
- \nRightarrow Caius was informed of the murder of Caesar.

Zucchi himself discusses entailment patterns analogous to (19) as a fatal problem for his analysis. Given that Caesar was murdered, then the murder of Caesar and the death of Caesar are the same event.¹

An easy fix?

- we could just add a modal operator to catch the event description (evaluate it in the relevant possible worlds)
- For concreteness, we assume Frana and Rawlin's (2011) entry for *inform* in (20), which we extend to events in (21).²

- (20) $\llbracket \text{inform}(\mathbf{x} \text{ that } \mathbf{p}) \rrbracket^w(x)(p)(y) = \exists e. \exists \alpha: e \text{ is an event of } y \text{ uttering } \alpha \text{ to } x \text{ in } w$
 $\& \forall w' \in \llbracket \alpha \rrbracket^{w'} \rightarrow p(w')$

¹For people unconvinced by this premise, Zucchi offers the following example:

- (i)
- a. Oedipus was informed of the arrival of Jocasta.
 - b. Jocasta is Oedipus' mother.
 - c. Oedipus was informed of the arrival of his mother.

²Here we are ignoring here the factivity requirement imposed by event-selecting *inform*, which could be implemented via a presupposition, or by imposing that the event holds at the actual worlds as well as at the worlds quantified over by the intensional operator. Our proposal (next) will actually derive the factivity.

- (21) $\llbracket \text{inform (x of e)} \rrbracket^w(x)(e)(y) = \exists e'. \exists \alpha: e' \text{ is an event of } y \text{ uttering } \alpha \text{ to } x \text{ in } w \ \& \ \forall w' \in \llbracket \alpha \rrbracket^{w'} \rightarrow e \text{ occurs in } w'$

The so-amended analysis correctly predicts the lack of entailment in (13), as shown next:

- (22) At 2pm, Caius was informed that Caesar had died, the report did not include the cause of death (for e.g. a reliable source uttered to Caius “Caesar died”).
- (23) $\llbracket \text{Caius was informed of the murder of Caesar} \rrbracket^w = \exists y. \exists e'. \exists \alpha: e' \text{ is an event of } y \text{ uttering } \alpha \text{ to Caius in } w \ \& \ \forall w' \in \llbracket \alpha \rrbracket^{w'} \rightarrow \text{the murder of Caesar occurs in } w'$

The analysis correctly derives (23) as false in the given scenario because it is not the case that for every world w' at which the proposition expressed by *Caesar died* is true, w' is a world in which the event of Caesar’s murder occurred.

The problem of quantified DNs

However, Zucchi shows the problem runs deeper and entailment patterns analogous to (13) can be reproduced with quantified DNs as well. A quantified DN can take wide scope in terms of its quantification force but it is still opaque on the event description. Zucchi demonstrates this with nouns quantified by *only three*.

- (24) John was informed of only three arrivals of Mary.

In this case though, we don’t want to interpret the quantified event description in the scope of *inform* because (24) doesn’t mean:

- (25) J. is informed that [occurred(only three arrivals of Mary)]

(24) can be true if John was never told of the number of arrivals of Mary; rather, it means that for (only) these three arrivals, was he informed of them. So we want the quantificational force to scope out as shown in (26) (where X ranges over whatever semantic type *only three* ... denotes).

- (26) [Only three arrivals of Mary] λX [J. is informed that [occurred(X)]]

The problem though is that this takes the event description out of the intensional scope of the matrix verb, predicting that substitution of extensional equivalents will be possible. This is not correct as we now show by demonstrating that even when the quantificational force is interpreted outside the scope of the intensional operator, the event description is interpreted inside the intensional operator, i.e. must be opaque.

Another example: Assume that Charlie is attending a magic show. During the show, he sees the magician make a rabbit disappear several times. Each disappearance of the rabbit actually consists of a quick jump of the rabbit inside a box, which his eyes do not register. In this scenario, (27a) does not entail (27c). However, given that each ‘disappearing event’ is also a ‘jumping event’, the event-analysis predicts the entailment.

- (27) a. Charlie knew of/was aware of every disappearance of the rabbit.
 b. Every disappearance of the rabbit was a jumping of the rabbit inside the box.
 c. \nRightarrow Charlie knew of/was aware of every jumping of the rabbit inside the box.

We need the event description to be **part of the propositional content** of the argument of the verb, to account for the failure of substitution above. But, at the same time, we want the nominalization to scope out for the purposes of its quantificational determiners.³

3 Frana and Moulton 2017: a comparison to concealed questions

3.1 Concealed Questions

CQs are nominal arguments of (certain) question-embedding verbs that can be paraphrased as questions/propositions. Some examples and their paraphrases are given below (let’s assume that the actual price of the new iPhone is \$800 and that the kind of wine Clara likes the most is Pinot Grigio).

- (28) a. Gianni knows *the price of the new iPhone*.
 b. Gianni knows what the price of the new iPhone is/that the new iPhone costs \$800.
- (29) a. Gianni can’t remember *the kind of wine Clara likes the most*.
 b. Gianni can’t remember what kind of wine Clara likes the most/that the wine Clara likes the most is Pinot Grigio.

CQs display interesting similarities with ConPs: although syntactically DPs, they can serve as arguments of certain question/proposition selecting verbs and can be paraphrased by questions/propositions; they also occupy intensional argument positions, thus not allowing for substitution of equivalents.

- (30) a. Gianni knows the price of the new iPhone.
 b. The new iPhone costs the same as a 4-year membership at the local gym.

³There is a literature of so-called wide scope, opaque interpretations (Szabo 2015). We may be seeing instances of such thing, although we leave this for future research.

- c. \nRightarrow Gianni knows the price of a 4-year membership at the local gym.

Heim (1979): CQs denote intensions of individuals, i.e., individual concepts (ICs), functions from possible worlds into individuals:

$$(31) \quad \text{the price of the new iPhone}_{\langle s, e \rangle}$$

$$\left[\begin{array}{l} w_0 \rightarrow \$800 \\ w_1 \rightarrow \$900 \\ w_2 \rightarrow \$1200 \\ \dots \end{array} \right]$$

Informally, a sentence ‘a knows/is aware of the CQ’, construed as an IC, gives us true iff the value that the concept yields at the actual world equals the value that the concept yields at all of the attitude holder doxastic alternatives (for instance, ‘John knows/is aware of the price of the new iPhone’ is true iff the concept in (31) outputs the same value at the actual world and at each of John’s belief worlds). Since the price of the new iPhone and the price of a 4-year membership at the local gym are not the same concept (they only share the same extension at the actual world), then the lack of entailment in (15) is derived. The first step of our proposal is to generalize this solution to the domain of events.

Analysis of definite DNs with event-concepts

We assume that the nominal predicate of a DN denotes a property P of events, whereas a definite DN denotes the (uniquely salient) event e that satisfies P in w (32). The intension of e (an event concept) is a function from possible worlds w’ to events. The ConP reading of a simple sentence, such as *Caius knew of the death of Caesar* is derived in (34), which employs Romero (2005)’s entry for individual-concept selecting *know*, which we extend to event-concepts in (33). In (28), the denotation of *know* combines with the event-argument (type E) via intensionalized functional application Heim and Kratzer (1998):

$$(32) \quad \llbracket \text{the DOC} \rrbracket^w = \iota e: e \text{ is a death of Caesar in } w$$

$$(33) \quad \llbracket \text{know of} \rrbracket^w = \lambda f_{\langle s, E \rangle}. \lambda x_e. \forall w' \in \text{Dox}_x [f(w') = f(w)]$$

$$\begin{aligned} (34) \quad & \llbracket \text{know of} \rrbracket^w (\lambda w' \llbracket \text{the DOC} \rrbracket^{w'}) (\text{Caius}) \\ &= \forall w' \in \text{Dox}_C (\lambda w' \llbracket \text{the DOC} \rrbracket^{w'} (w') = \lambda w' \llbracket \text{the DOC} \rrbracket^{w'} (w)) \\ &= \forall w' \in \text{Dox}_C (\llbracket \text{the DOC} \rrbracket^{w'} = \llbracket \text{the DOC} \rrbracket^w) \\ &= \forall w' \in \text{Dox}_C [\iota e: e \text{ is a death of Caesar } w' = \iota e: e \text{ is a death of Caesar in } w] \end{aligned}$$

The formula in (34) is true in the world of evaluation w iff in each one of Caius’ belief worlds w’ (at w), the event of Caesar’s death in w is the event of his death in w’. Even if the death of Caesar and the murder of Caesar are the same event in w—say, e_{40} —(35a) is true *iff* (the

counterpart of) e_{40} is a dying of Caesar in all w' —not necessarily a murdering of Caesar. Thus, (35a) does not entail (35b).

- (35) a. Caius knew of the death of Caesar.
 b. The death of Caesar is the murder of Caesar
 \nRightarrow Caius knew of the murder of Caesar.

Thus, event concepts allow us to derive the lack of substitution of equivalents for attitude predicates, such as *know of*, without invoking QR.⁴

We also derive the factivity of ConPs naturally: (34) entails that the death of Caesar happens in the the actual world. This is a consequence of the analysis modeled after CQs: it captures both the opacity and factivity. As we saw above, when such verbs select propositions they are not necessarily factive.

- Frana has a story for how to handle quantified CQs, and this could be extended to the quantified cases that Zucchi has trouble with

This is the best we’ve come up with, but it seems to make ConPs identificational like CQs: don’t we just want the *X was informed of DN* to mean that X was informed that the event described by DN happened (and believe that description provided by DN). The CQ analysis is stronger in a way.

4 References

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⁴An event-concepts analysis could also be given for verbs of communication; we won’t do this here, however, for reasons of space.